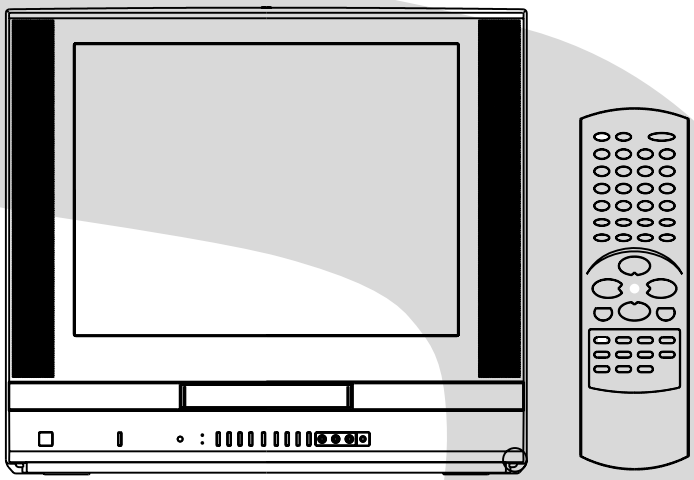
TOSHIBA

FILE NO. 140-200208

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER

MV20FM3



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

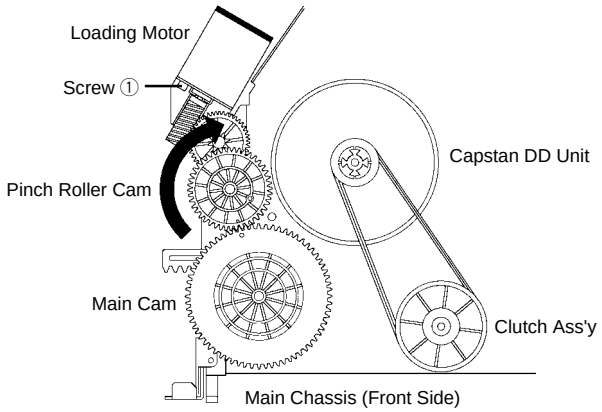
HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the VCR block from the main unit.
   (Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)
2. Remove the screw ① of the Deck Chassis and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape.
4. Rotate the Clutch Ass'y either of the derections to wind the Video Tape in the Cassette Case.
5. Repeat the above step 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch on the tape.



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GENERAL SPECIFICATIONS

G-1	**TV System**	CRT		CRT Size / Visual Size	20 inch / 508.0 mmV
				CRT Type	Flat
				Deflection	90 degree
				Magnetic Field BV/BH	+ 0.45 G / 0.18 G
		Color System			NTSC
		Speaker			2 Speaker
				Position	Front
				Size	3 Inch
				Impedance	8 ohm
		Sound Output		MAX	1.5W + 1.5W
				10%(Typical)	1.5W + 1.5W
G-2	**VCR System**	System			VHS Player / Recorder
		Video System			NTSC
		Hi-Fi STEREO			Yes
		NTSC PB			-
		Deck		DECK	OVD-7
				Loading System	Front
				Motor	3
		Heads	Video Head		4 Head
			FM Audio Head		2 Head
			Audio /Control		Mono /Yes
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec	PAL	-
				NTSC	SP/SLP(EP)
			Play	PAL	-
				NTSC	SP/SLP(EP)
		Fast Forward / Rewind Time (Approx.) at 25oC			FF:4'50"/REW:2'30"
				with Cassette	T-120
		Forward/Reverse Picture Search		NTSC or PAL-M	SP/SLP(EP) = 3x,5x / 9x,15x
		Frame Advance			1/10
		Slow Speed			1/10
G-3	**Tuning System**	Broadcasting System			US System M
		Tuner and Receive CH		System	1 Tuner
				Destination	US(w/CATV)
				Tuning System	F-Synth
				Input Impedance	VHF/UHF 75 ohm
				CH Coverage	2~69, 4A,A-5~A-1, A~I, J~W,W+1~W+84
		Intermediate Frequency		Picture(FP)	45.75MHz
				Sound(FS)	41.25MHz
				FP-FS	4.5MHz
		Preset CH			No
		Stereo/Dual TV Sound			US-Stereo
		Tuner Sound Muting			Yes
G-4	**Signal**	Video Signal		Input Level	1 V p-p/75 ohm
				Output Level	1 V p-p/75 ohm
				S/N Ratio (Weighted)	50 dB
				Horizontal Resolution at SP Mode	220Line
		Audio Signal (0dB=0.775Vrms)		Input Level	-8dBm/50Kohm
				Output Level	-8dBm/1Kohm
				S/N Ratio at SP (Weighted)	38 dB
				Harmonic Distortion (1KHz) Typical	1.5 %
				Frequency Response at SP	100Hz - 10kHz
				at LP	-
				at SLP	100Hz - 4kHz
		Hi-Fi Audio Signal		Dynamic Range : More than	90 dB
				Wow And Flutter : Less than	0.01 %Wrms
				Channel Separation : More than	60 dB
				Harmonic Distortion : Less than	1.0 %
G-5	**Power**	Power Source		AC	120V,60Hz
				DC	-
		Power Consumption		at AC	110 W at 120 V 60 Hz
				at DC	-
				Stand by (at AC)	3 W at 120 V 60 Hz
				Per Year	-
		Protector		Power Fuse	Yes
				Dew Sensor	No

GENERAL SPECIFICATIONS

G-6	**Regulation**			Safety	UL
				Radiation	FCC
				X-Radiation	DHHS
G-7	**Temperature**			Operation	+5oC ~ +40oC
				Storage	-20oC ~ +60oC
G-8	**Operating Humidity**				Less then 80% RH
G-9	**On Screen**	Menu			Yes
	Display		Menu	Type	Character
			Timer Rec Set		Yes
			Channel Setup		Yes
				TV/CATV	Yes
				Auto CH Memory	Yes
				Add/ Delete	Yes
				Guide CH Set	No
			TV Setup		Yes
				V-chip Set	Yes
				On/Off Timer Set	Yes
				Picture	Yes
				Audio	Yes
				Sap On/Off	Yes
			Auto Repeat On/Off		Yes
			System Setup		Yes
				Clock Set	Yes (Calendar 12h)
				Language	Yes
				Auto Clock On/Off	Yes
				Standard Time	Yes
				Daylight Saving Time	Yes
			Commercial Advance		No
				Marking On/Off	No
				Blueback On/Off	No
				Playback Auto/Manual	No
				Unmarked Tape	No
			Movie Advance		No
				Go To Movie	No
				Go To Preview	No
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry			No
		Clock / Date			Yes
		CH/AV			Yes
		Tape Counter(Linear Counter)			Yes
		Tape Speed			Yes
		Sleep Time			Yes
		Stereo/Audio Output			Yes
				Bilingal	No
				SAP	Yes
		Control Level	Volume		Yes
			Bright / Contrast / Sharpness / Color		Yes
			Tint		Yes
			Bass/Treble/Balance		Yes
			Manual Tracking		Yes
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)			Yes
		Auto Tracking/Manual Tracking			Yes
		Caption / Text			Yes
		Index			No
		Muting			Yes
		Hi-Fi			Yes
		Repeat			Yes
		Zero Return			No
		DEW			No
G-10	**OSD Language**				English French Spanish
G-11	**Clock,Timer**	Calendar			1990/1/1 ~ 2081/12/31
	and Timer	Timer Events			8 Program/ 1 Month
	Back-up	One Touch Recording Max Time			5 Hours
		OTPB Valid Time			-
		Sleep Timer		Max Time	120 Min
				Step	10 Min
		On/Off Timer		Program(On Timer / Off Timer)	1 Program
		Auto Shut Off		No Signal	15 Min
				No Operation	- Min
		Timer Back-up (at Power Off Mode)			5 Sec

GENERAL SPECIFICATIONS

G-12	**Remote Control**	Unit		RC-DQ
		Glow in Dark Remocon		Yes
		Format		NEC
		Custom Code		40-BFh,44-BBh
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		44 Keys
		Keys	Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			CH Up	Yes
			CH Down	Yes
			Volume Up	Yes
			Volume Down	Yes
			Input Select	Yes
			Play	Yes
			F.Fwd	Yes
			Rew	Yes
			Pause/Still	Yes
			Stop	Yes
			Rec/OTR	Yes(2Keys)
			Eject	Yes
			Counter Reset	Yes
			Speed	Yes
			Timer Rec	Yes(2Keys)
			TV Monitor	No
			Quick View	Yes
			Program	Yes
			Slow	Yes
			Auto Tracking	Yes
			Set/Tracking+	Yes
			Set/ Tracking -	Yes
			Menu	Yes
			Enter	Yes
			Cancel	Yes
			Call	Yes
			TV/Caption/Text	Yes
			Sleep Timer	Yes
			Muting	Yes
			Zero Return	Yes
			CM Skip	Yes
			Audio Select	Yes

GENERAL SPECIFICATIONS

G-13	**Features**	Auto Head Cleaning		No
		Auto Tracking		Yes
		HQ (VHS Standard High Quality)		Yes
		Auto Power On, Auto Play, Auto Rewind, Auto Eject		Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		Auto Clock		Yes
		Forward / Reverse Picture Search		Yes
		Reverse Slow		No
		One Touch Playback		No
		Auto CH Memory		Yes
		Closed Caption		Yes
		TV Auto Shut off Function		Yes
		End Call		No
		Index Search		No
		SQPB		No
		CATV		Yes
		CM Skip(30sec x 6 Times)		Yes
		Comb Filter		Yes
		TV Monitor		No
		Program Extend		No
		Choke Coil		No
		Energy Star		Yes
		Protect of FBT Leak Curcuit		Yes
		Zero Return		Yes
		Power On Memory		No
		Dirty Head		No
		V-chip USA V-chip		Yes
		CANADA V-chip		No
		CM Advance		No
		Movie Advance		No
G-14	**Accessories**	Owner's Manual	Language	English
			w/Guarantee Card	Yes
		Remote Control Unit		Yes
		Battery		Yes
			UM size x pcs	UM-4 x 2 pcs
				No
		Rod Antenna		No
			Poles	-
			Terminal	-
		Loop Antenna		No
			Terminal	-
		U/V Mixer		No
		300 ohm to 75 ohm Antenna Adapter		Yes
		Antenna Change Plug		No
		DC Car Cord (Center+)		No
		AC Plug Adapter		No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Guarantee Card		No
		Registration Card		Yes
		ESP Card		Yes
		Warning Sheet		No
		Dew/AHC Caution Sheet		No
		Quick Set-up Sheet		No
		Circuit Diagram		No
		Service Facility List		No
		Important Safeguard		No

GENERAL SPECIFICATIONS

G-15	**Interface**	Switch		Power	Yes
				Play	Yes
				Pause/Still	No
				System Select	No
				One Touch Playback	No
				Channel Up	Yes
				Channel Down	Yes
				F.FWD/Cue	Yes
				Eject/Stop	Yes
				Main Power SW	No
				Volume Up	Yes
				Volume Down	Yes
				Rew/Rev	Yes
				Rec/OTR	Yes
				Input Select	No
		Indicator		Power	No
				Rec/OTR	Red
				T-Rec	Red
				On Timer	No
				CS	No
		Key Light up		Rec/OTR	No
				One Touch Playback	No
				Play	No
		Terminals	Front	Video Input	RCAx1
				Audio Input	RCA x 2(Stereo)
				Other Terminal	Head Phone(Stereo & Mono, 3.5mm)
			Rear	Video Input	RCAx1
				Audio Input	RCA x 2(Stereo)
				Video Output	RCAx1
				Audio Output	RCA x 2(Stereo)
				Euro Scart	No
				Diversity	No
				Ext Speaker	No
				DC Jack 12V(Center +)	No
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-16	**Set Size**			Approx. W x D x H (mm)	574 x 483 x 514.5
G-17	**Weight**			Net (Approx.)	26.5 kg(58.5 lbs)
				Gross (Approx.)	28.5 kg(62.9 lbs)
G-18	**Carton**		Master Carton		No
				Content	-
				Material	-
				Dimensions W x D x H(mm)	-
				Description of Origin	-
			Gift Box		Yes
				Material	DOUBLE/WHITE
				Dimensions W x D x H(mm)	647 x 620 x 625
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test	Natural Dropping At	1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	31
			Container Stuffing(40' container)		171 Sets
G-19	**Cabinet Material**			Cabinet Front	PS 94V0 DECABROM
				Cabinet Rear	PS 94V0 DECABROM
				Jack Panel	PS 94V0

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

1. Remove the 6 screws ①.
2. Remove the 2 screws ② which are used for holding the Back Cabinet.
3. Remove the AC cord from the AC cord hook ③.
4. Remove the Back Cabinet in the direction of arrow.

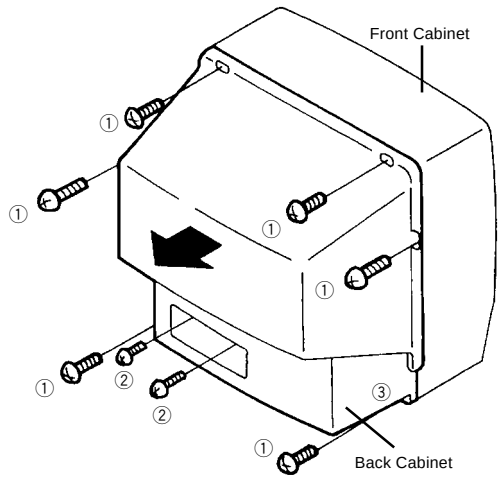


Fig. 1-1

1-2: CRT PCB (Refer to Fig. 1-2)

CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap. (Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors: (CP802 and CP805).
3. Remove the CRT PCB in the direction of arrow.

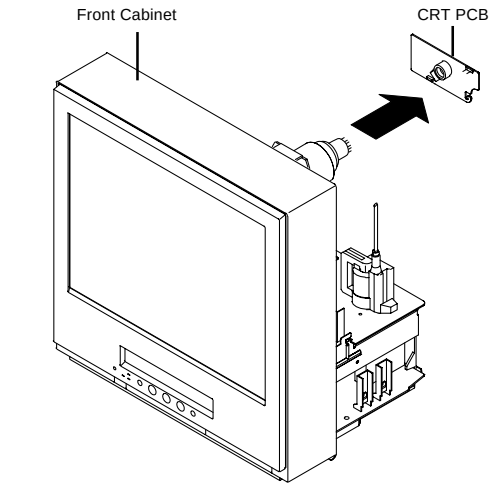


Fig. 1-2

1-3: TV/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors: (CP401, CP502, CP2201 and CP4202).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.

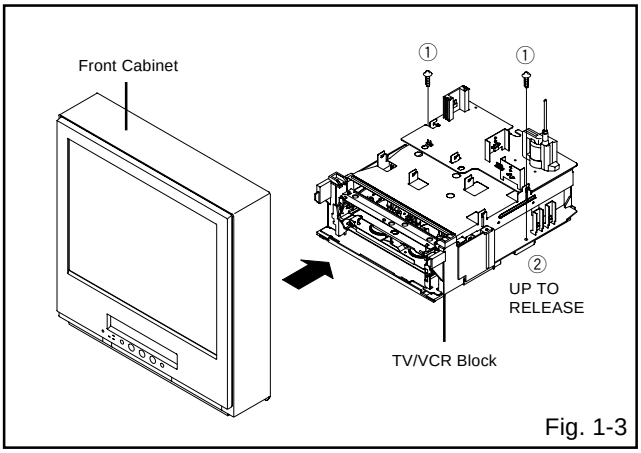


Fig. 1-3

1-4: MAIN PCB (Refer to Fig. 1-4)

1. Remove the screw ①.
2. Remove the Main PCB Holder.
3. Remove the screw ②.
4. Remove the TV-PCB Holder.
5. Remove the 2 screws ③.
6. Remove the 3 screws ④.
7. Disconnect the following connectors: (CP810A, CP820A, CP403 and CD402).
8. Remove the Main PCB in the direction of arrow.

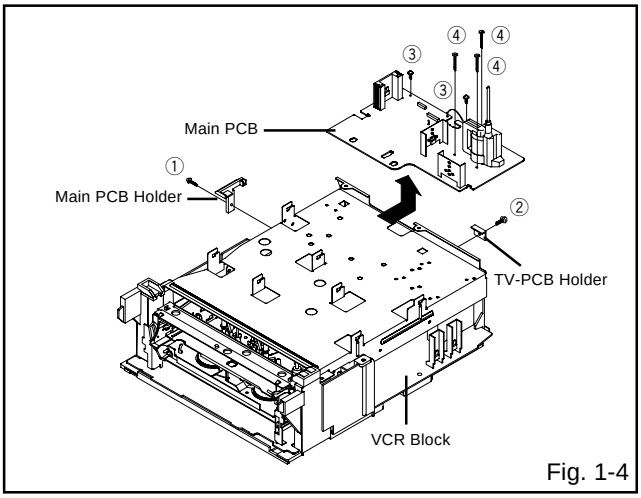


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

1-5: DECK SHIELD PLATE AND BOTTOM SHIELD (Refer to Fig. 1-5)

1. Remove the 2 screws ①.
2. Remove the screw ②.
3. Remove the Deck Shield Plate in the direction of arrow (A).
4. Remove the screw ③.
5. Remove the Bottom Shield in the direction of arrow (B).

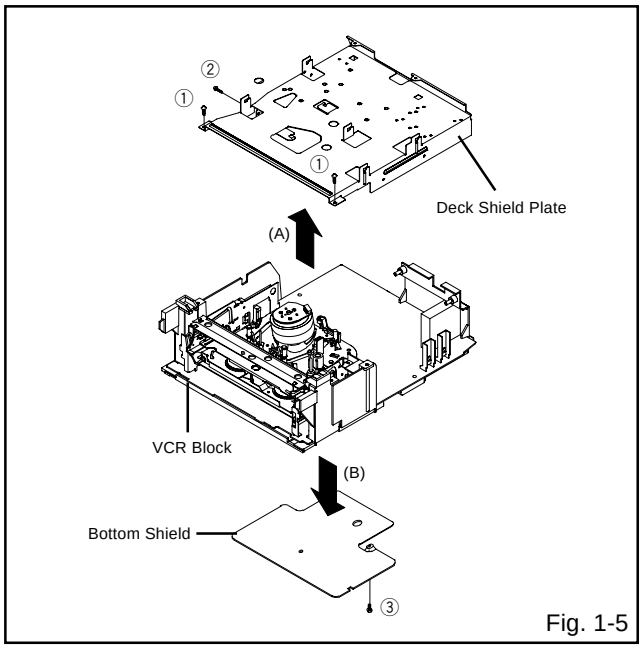


Fig. 1-5

1-6: DECK CHASSIS (Refer to Fig. 1-6)

1. Remove the screw ①.
2. Remove the Plate Cover Light.
3. Remove the 3 screws ②.
4. Disconnect the following connectors: (CP1001, CP4001, CP4002 and CP4003).
5. Remove the Deck Chassis and AC Head Cover in the direction of arrow.

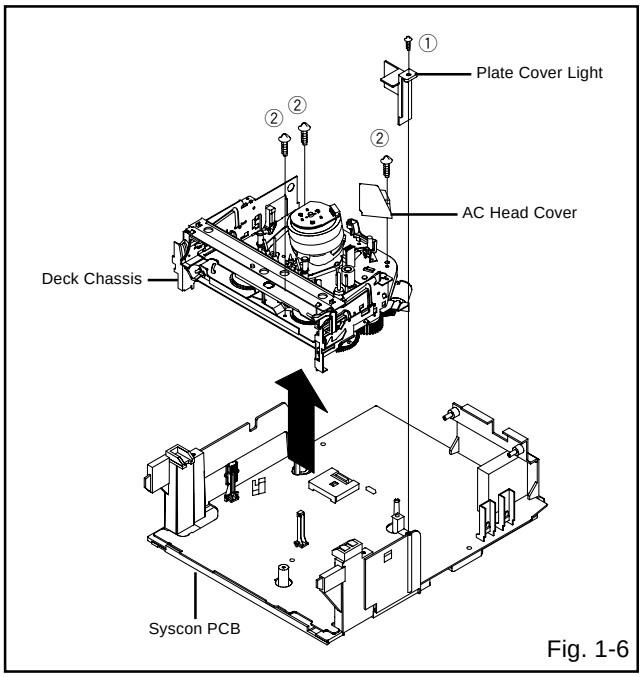


Fig. 1-6

1-7: JACK PLATE AND SYSCON PCB (Refer to Fig. 1-7)

1. Remove the screw ①.
2. Remove the Syscon PCB in the direction of arrow (A).
3. Remove the 2 screws ②.
4. Unlock the 2 supports ③.
5. Remove the Jack Plate in the direction of arrow (B).

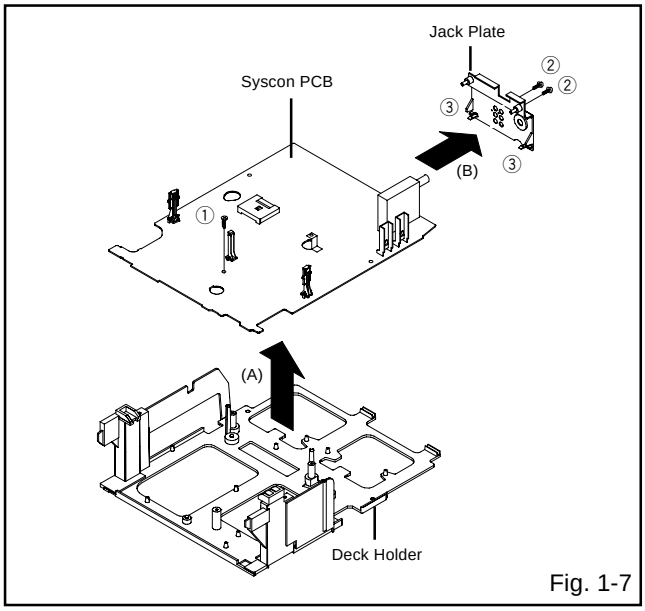


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

1. After the installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.

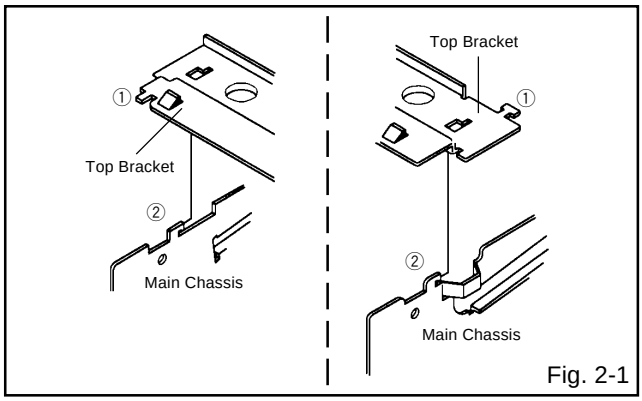


Fig. 2-1

2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

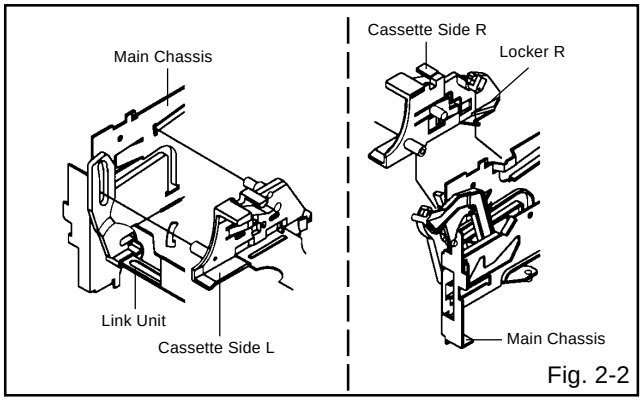


Fig. 2-2

2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.

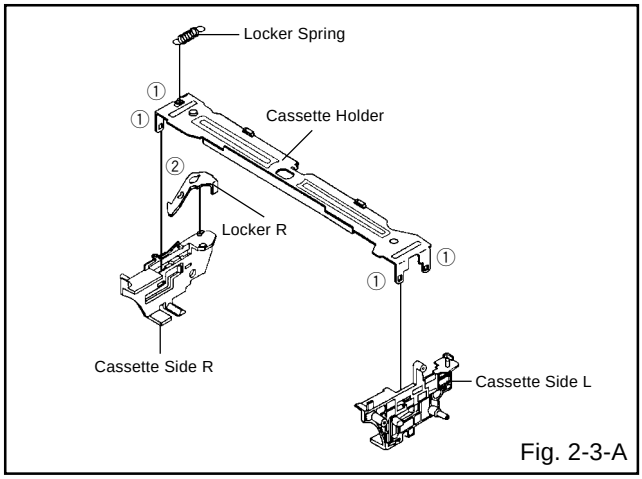


Fig. 2-3-A

NOTE

1. In case of the Locker R installation, check if the two positions of Fig.2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.

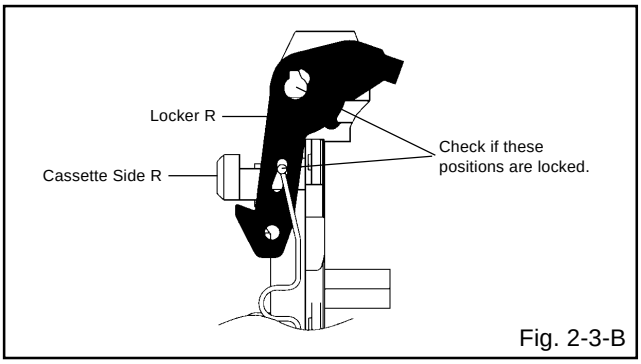


Fig. 2-3-B

2-4: LINK UNIT (Refer to Fig. 2-4)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.

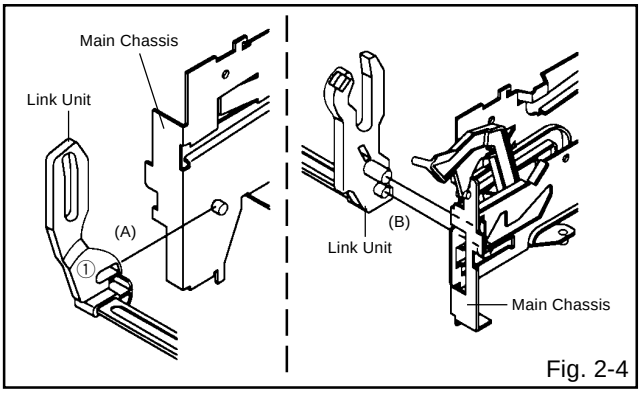


Fig. 2-4

2-5: LINK LEVER/FLAP LEVER (Refer to Fig. 2-5)

1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.

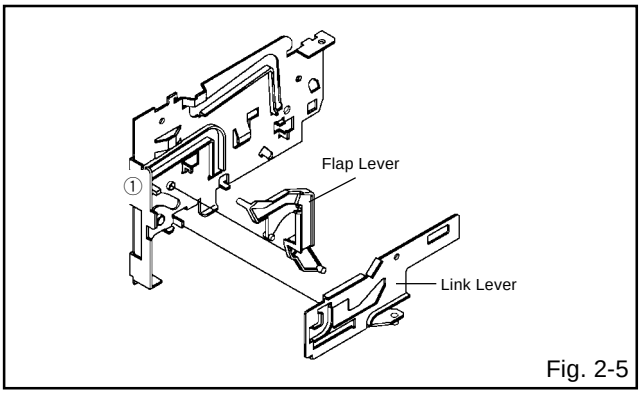
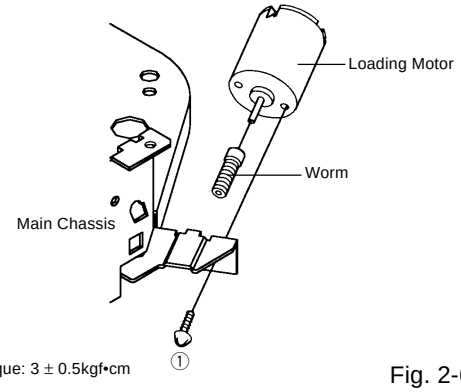


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.



• Screw Torque: 3 ± 0.5kgf•cm

Fig. 2-6-A

NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.

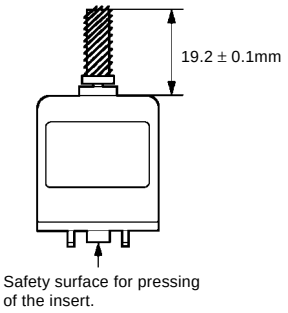


Fig. 2-6-B

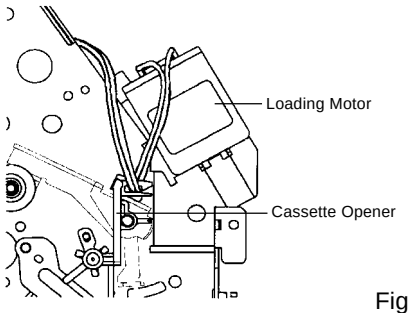


Fig. 2-6-C

2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.

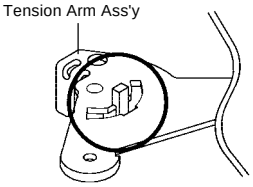


Fig. 2-7-A

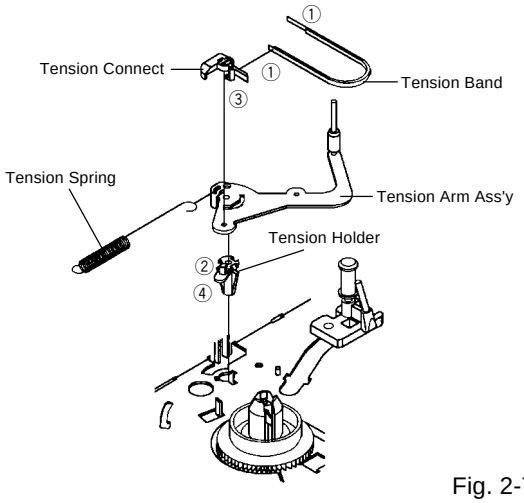


Fig. 2-7-B

NOTE

1. In case of the Tension Band installation, note the direction of the installation. **(Refer to Fig. 2-7-C)**
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.

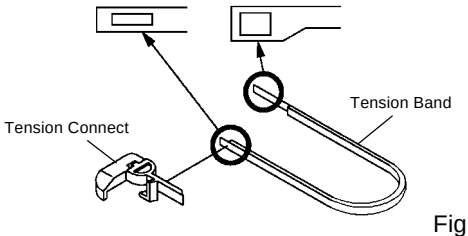


Fig. 2-7-C

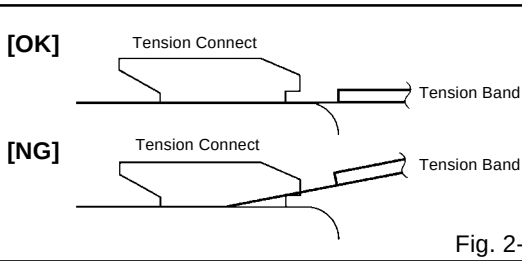


Fig. 2-7-D

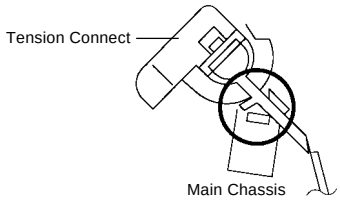


Fig. 2-7-E

DISASSEMBLY INSTRUCTIONS

2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.

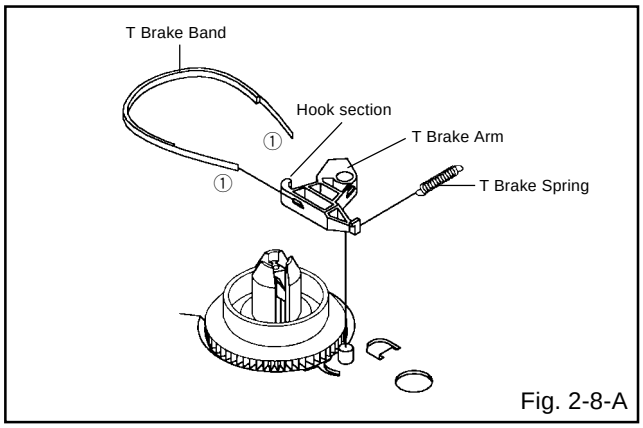


Fig. 2-8-A

NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

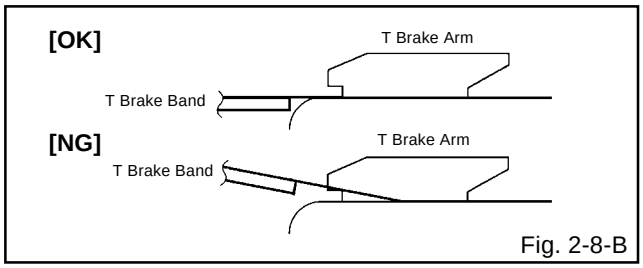


Fig. 2-8-B

2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-9-A)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

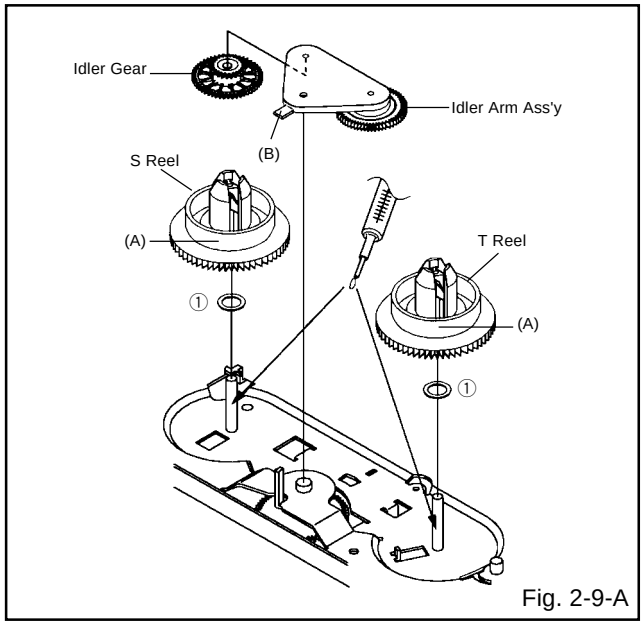


Fig. 2-9-A

NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. **(Refer to Fig. 2-9-B)**
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.

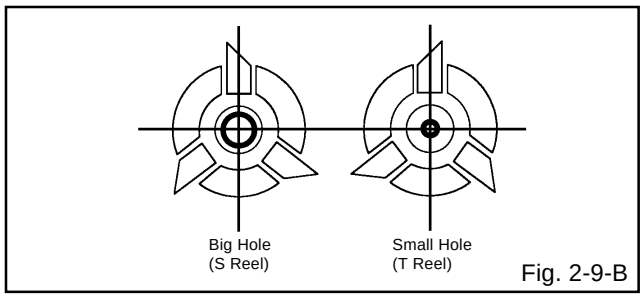


Fig. 2-9-B

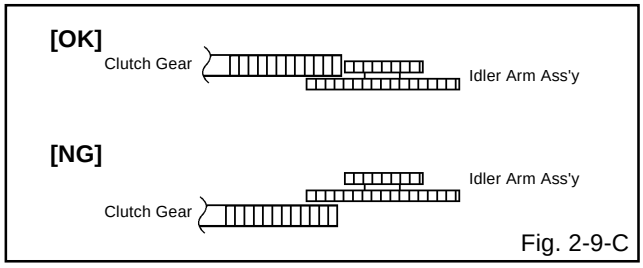


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-10-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.

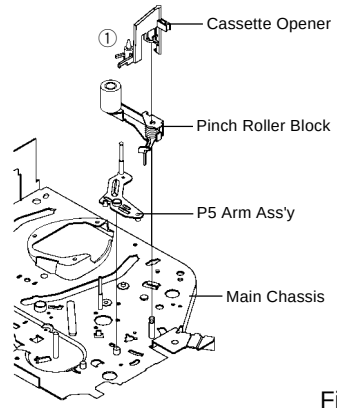


Fig. 2-10-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

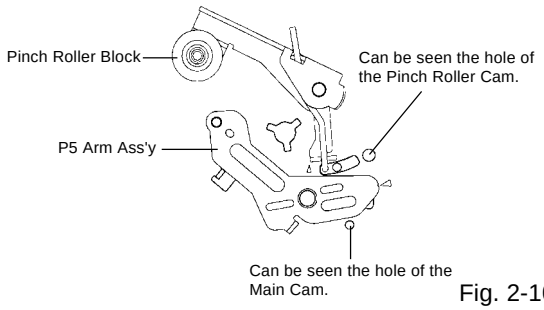


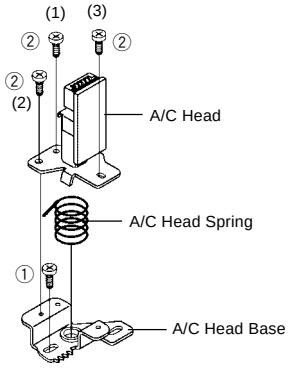
Fig. 2-10-B

2-11: A/C HEAD (Refer to Fig. 2-11-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque: 5 ± 0.5kgf•cm (Screw ①)

Fig. 2-11-A

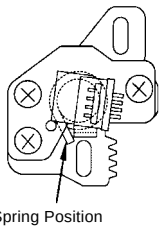
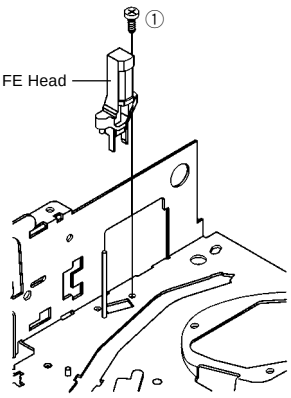


Fig. 2-11-B

2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

1. Remove the screw ①.
2. Remove the FE Head.



• Screw Torque: 5 ± 0.5kgf•cm
• The FE Head is not installed on the Video Cassette Player.

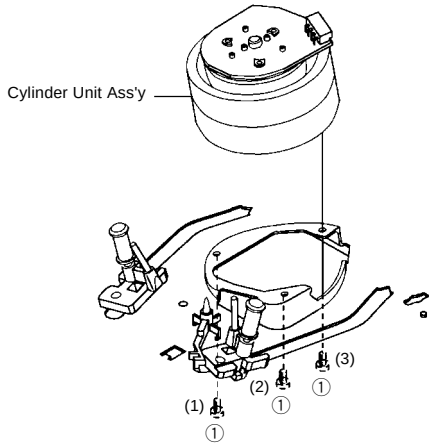
Fig. 2-12

2-13: CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

1. Disconnect the following connector: (CD2001)
2. Remove the 3 screws ①.
3. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



• Screw Torque: 3 ± 0.5kgf•cm

Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.

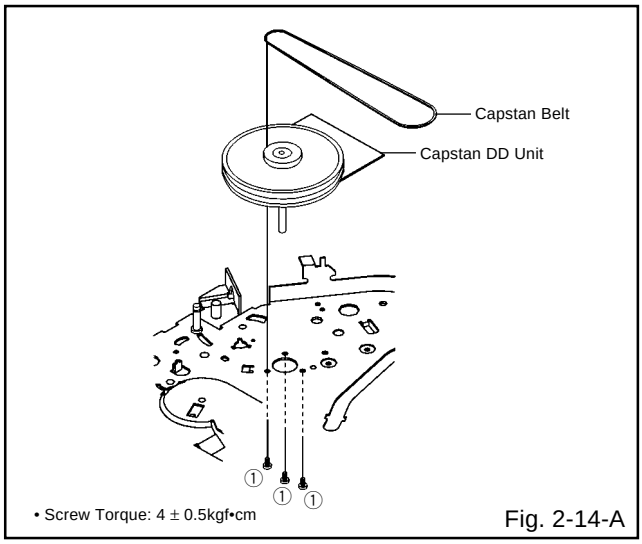


Fig. 2-14-A

NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.) **(Refer to Fig. 2-14-B, C)**

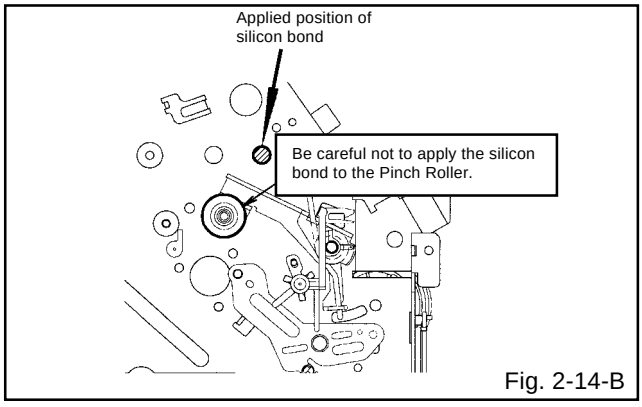


Fig. 2-14-B

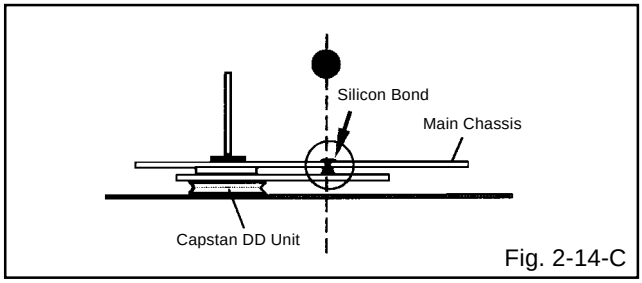


Fig. 2-14-C

2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.

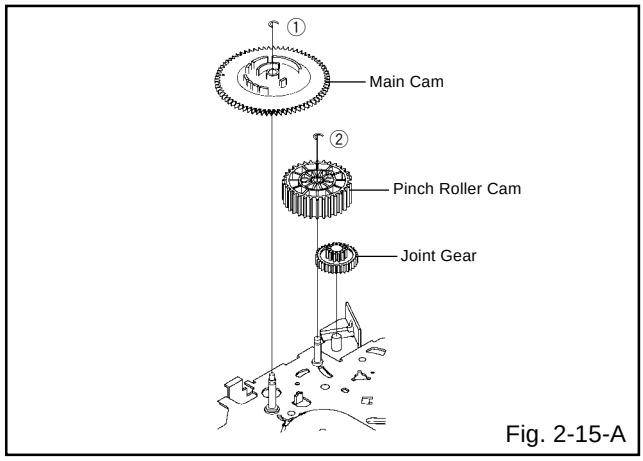


Fig. 2-15-A

NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. **(Refer to Fig. 2-15-B)**

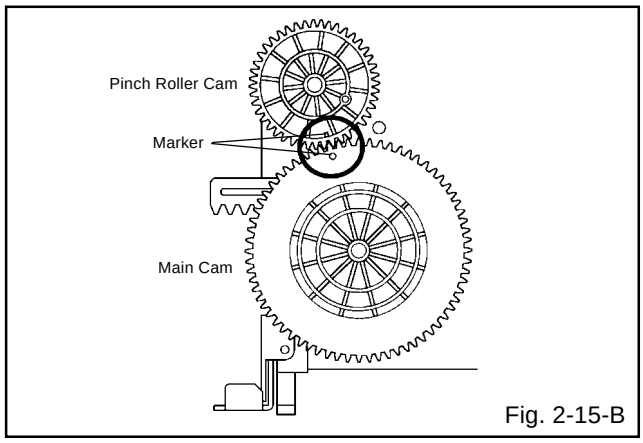


Fig. 2-15-B

2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

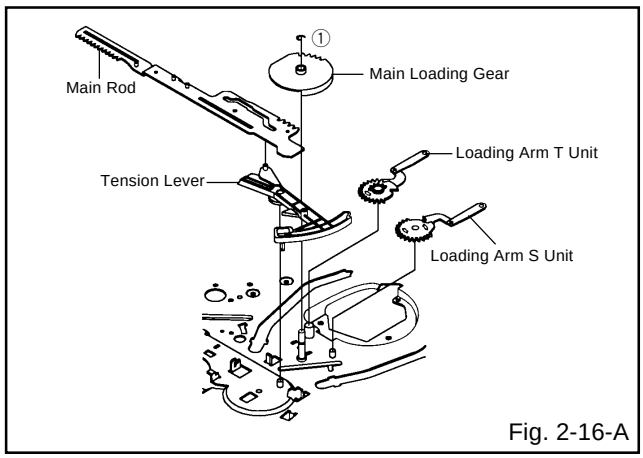


Fig. 2-16-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. **(Refer to Fig. 2-16-B)**

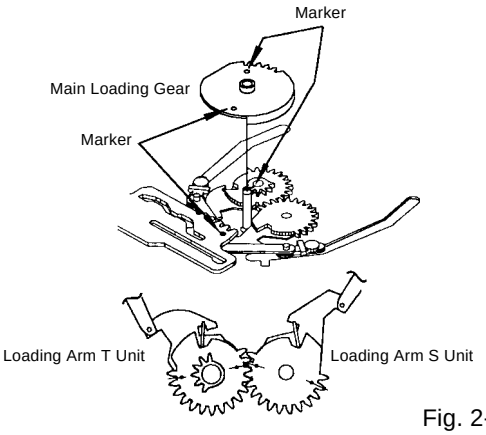


Fig. 2-16-B

2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.

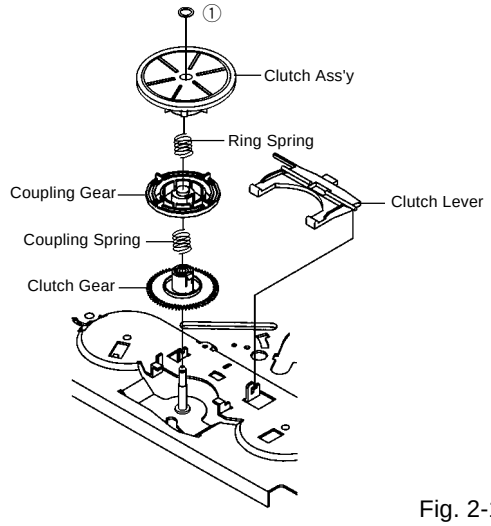


Fig. 2-17-A

NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. **(Refer to Fig. 2-17-B)**

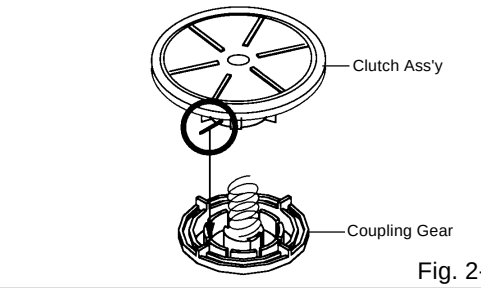


Fig. 2-17-B

2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S Unit and Inclined Base T Unit.

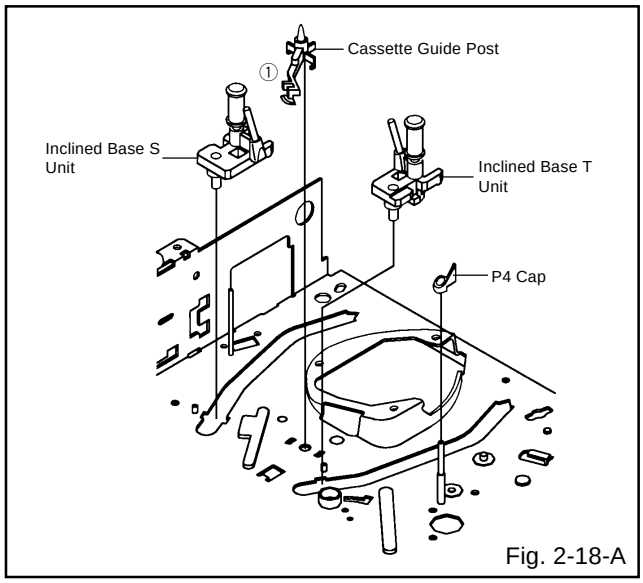


Fig. 2-18-A

NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.

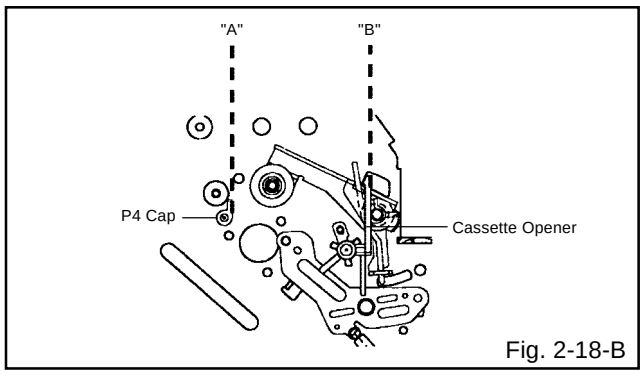


Fig. 2-18-B

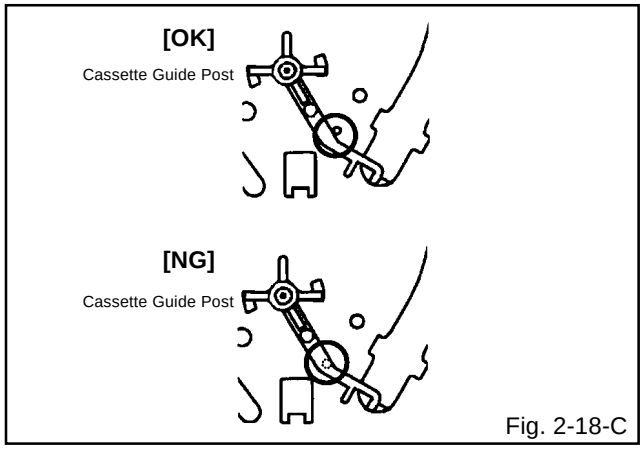


Fig. 2-18-C

DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 3-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

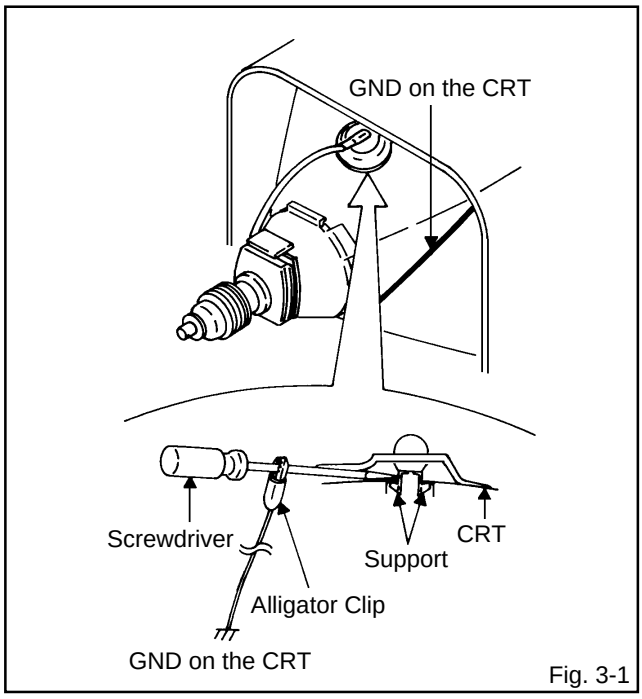


Fig. 3-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 3-2.)**

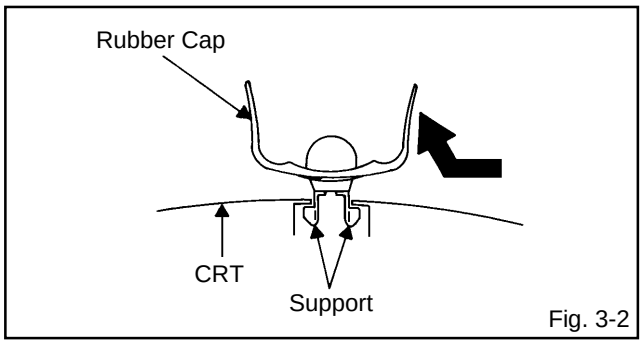


Fig. 3-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 3-3.)**

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

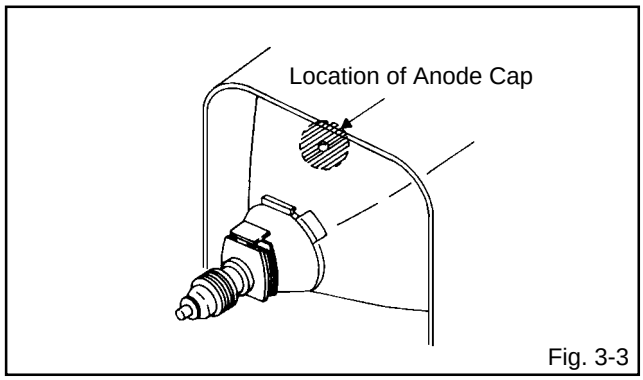


Fig. 3-3

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 3-4.)**

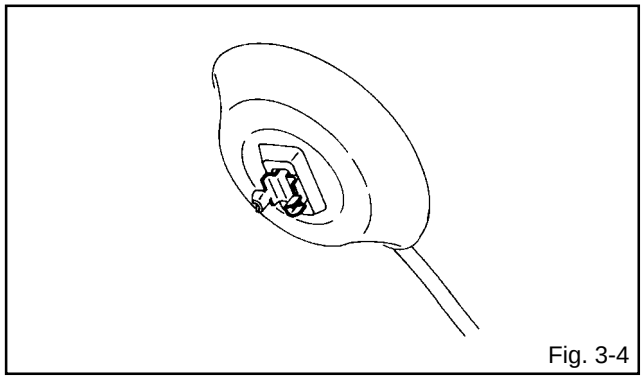


Fig. 3-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 3-5**.

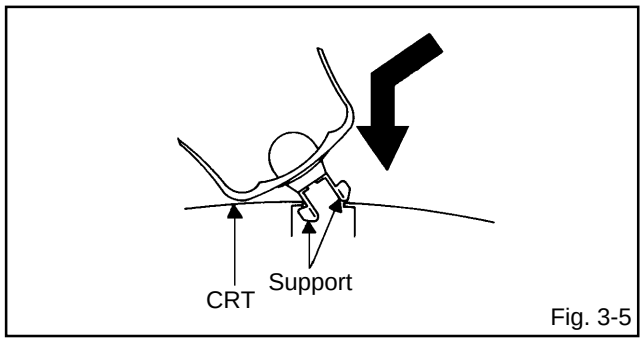


Fig. 3-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

4. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 4-1.)**

   NOTE

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

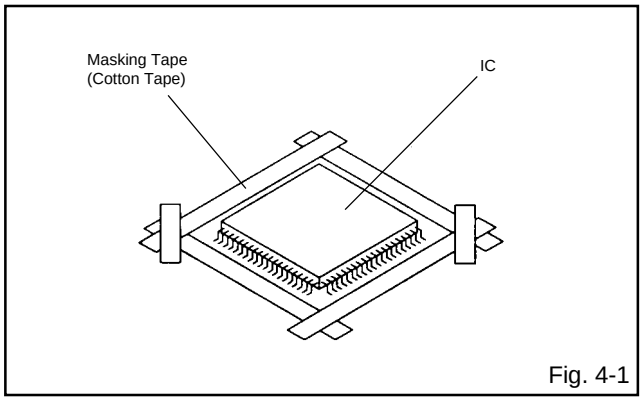


Fig. 4-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 4-2.)**

   NOTE

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

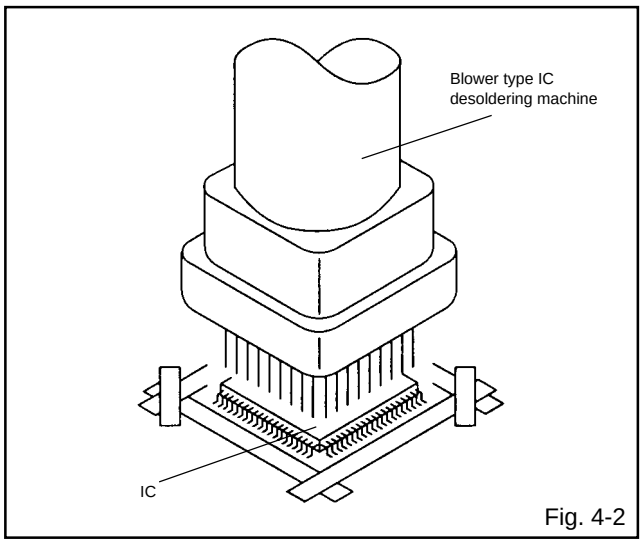


Fig. 4-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 4-3.)**

   NOTE

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

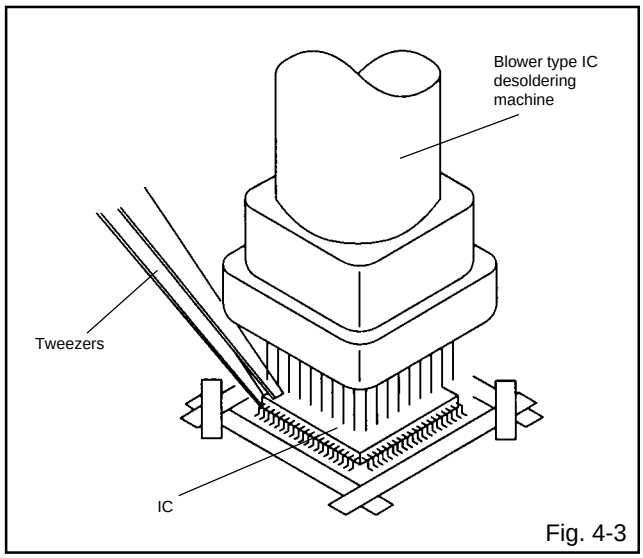


Fig. 4-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 4-4.)**

   NOTE

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

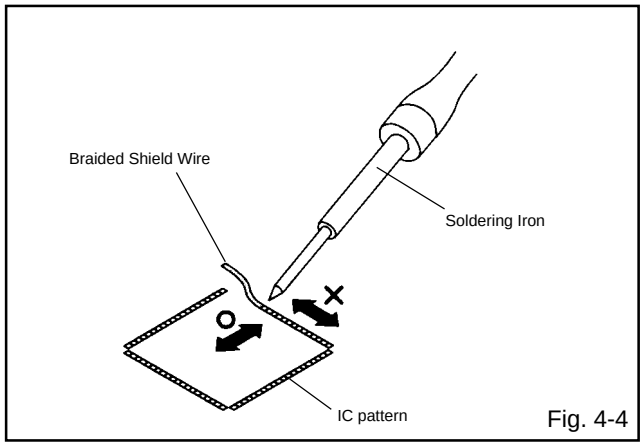


Fig. 4-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 4-5.)**

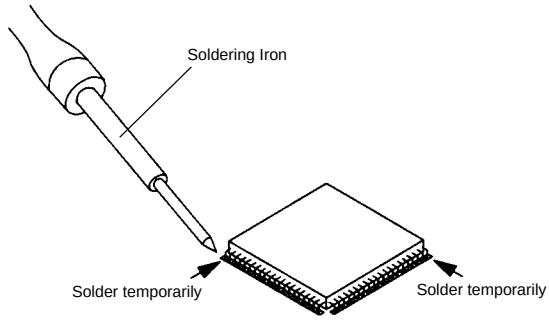


Fig. 4-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 4-6.)**

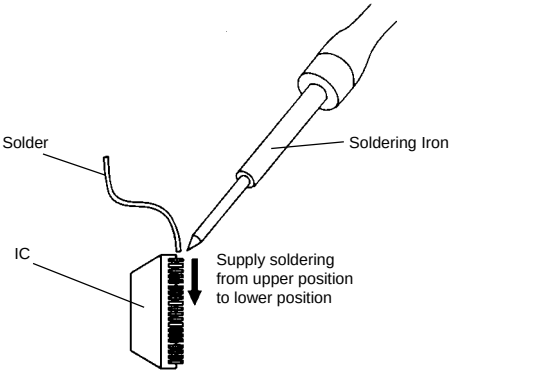


Fig. 4-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 4-7.)**

   NOTE

   Do not absorb the solder to excess.

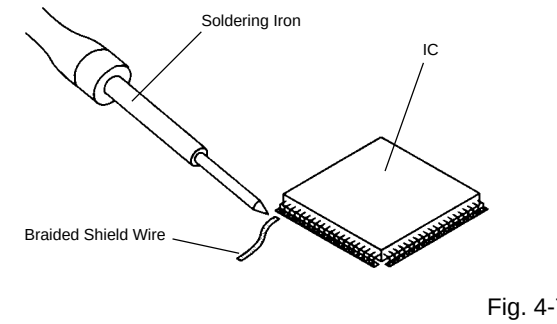


Fig. 4-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 4-8.)**

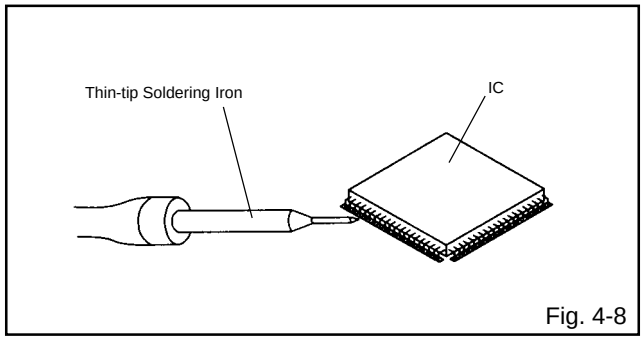


Fig. 4-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

   NOTE

   When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	**A/C**	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	**BGP**	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	**C**	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	**DATA (SY-CE)**	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	**E**	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	**F**	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flip-flop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	**GEN**	:	Generator
	GND	:	Ground
H	**H.P.F**	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	**IC**	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	**KIL**	:	Killer
L	**L**	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	**M**	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mecha State Switch
N	**NC**	:	Non Connection
	NR	:	Noise Reduction
O	**OSC**	:	Oscillator
	OPE	:	Operation
P	**PB**	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	**R**	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	**S. CLK**	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
VOL. (-) MIN	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more than 2 seconds during PLAY.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.
Parts replacing time does not mean the life span for individual parts.
Also, long term storage or misuse may cause transformation and aging of rubber parts.
The following list means standard hours, so the checking hours depends on the conditions.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

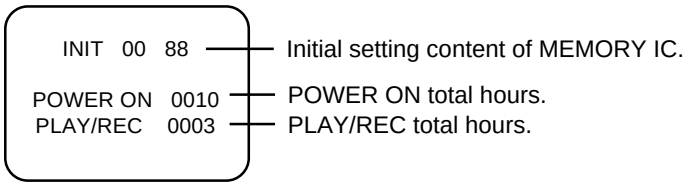
■ : Clean
● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

POWER ON total hours and PLAY/REC total hours can be checked on the screen.
Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".
The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control simultaneously.
3. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

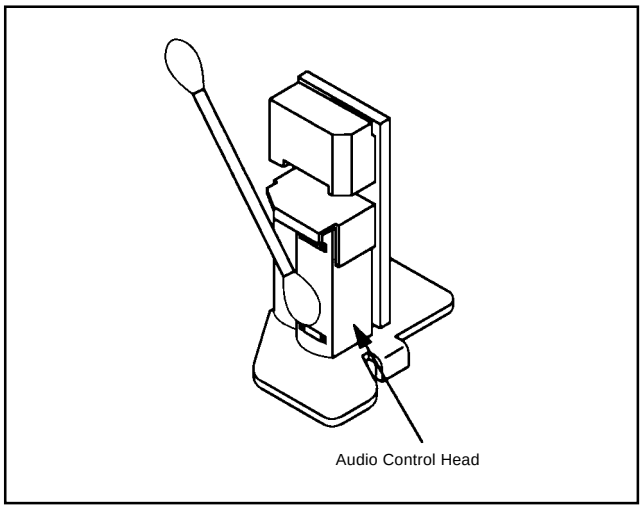
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

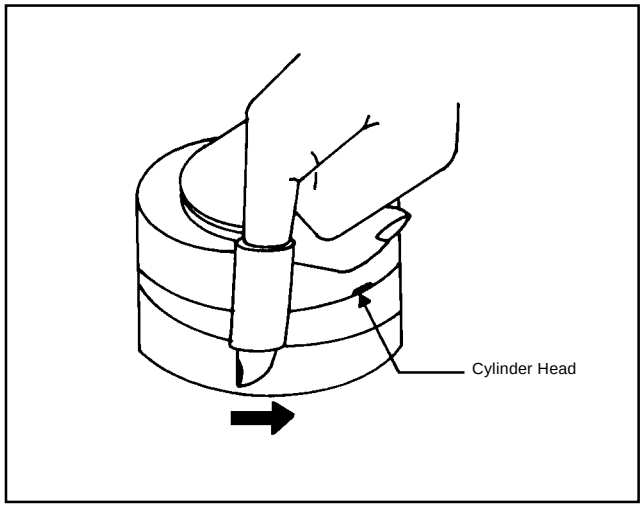
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head.
Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	88	7B	B2	47	4B	23	24	0B	51	A2	1C	62	56	11	17	1E
10	DC	A3	9A	94	27	00	32	05	8B	08	A9	55	94	3A	07	E1
20	83	25	05	15	30	00	3A	3B	91	01	62	45	26	07	67	48
30	09	49	0A	4A	6A	4B	6B	4C	6C	4D	6D	4E	6E	4F	6F	50
40	70	51	71	52	72	53	73	54	74	55	75	56	76	57	77	58
50	78	59	79	5A	7A	7A	5B	5B	7B	7B	5C	5C	7C	7C	5D	5D
60	7D	7D	5E	5E	7E	7E	5F	5F	7F	7F	---	---	---	---	---	---

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously. ADDRESS and DATA should appear as FIG 1.

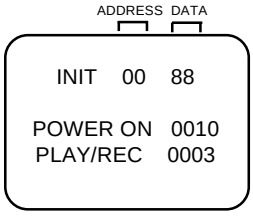
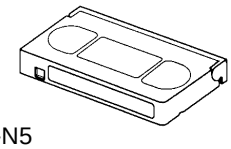
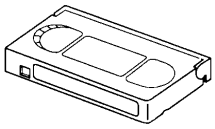
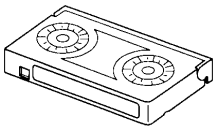
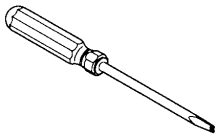
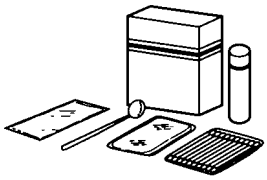
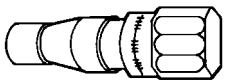
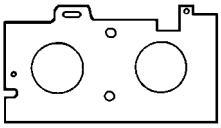
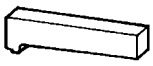
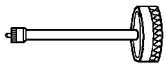
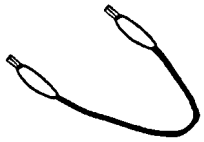
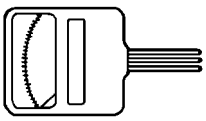


Fig. 1

3. ADDRESS is now selected and should "blink". Using the SET + or - button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET + or - button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-N5 ST-NF	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	JG154 Cable 
Tentelometer 			

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Remove the Main PCB and Syscon PCB from the set.
   Be sure to place the parts on a paper so that they have no short-circuit each other.
2. Short circuit between **TP1001** and **Ground** with the cable JG154.
   (The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
   Turn on the power and re-check the cable before checking the trouble points.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024A)** on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig **(JG024A)** and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
4. Adjust the other reel in the same way.

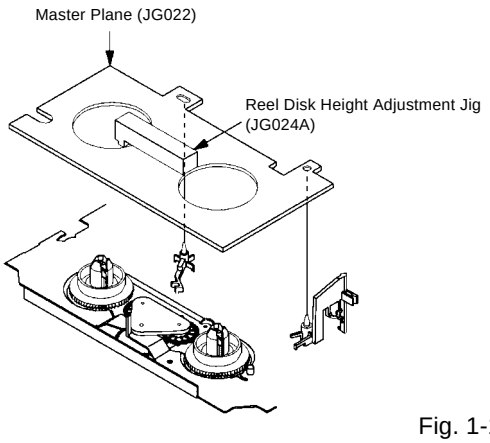


Fig. 1-1-A

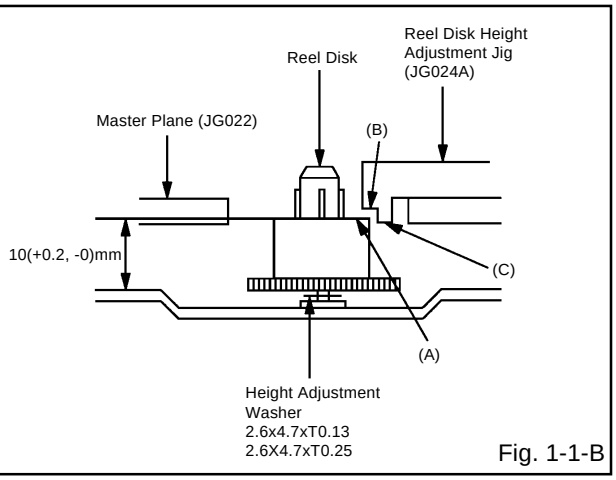


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

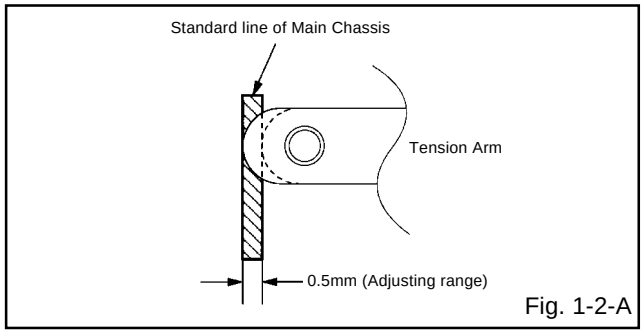


Fig. 1-2-A

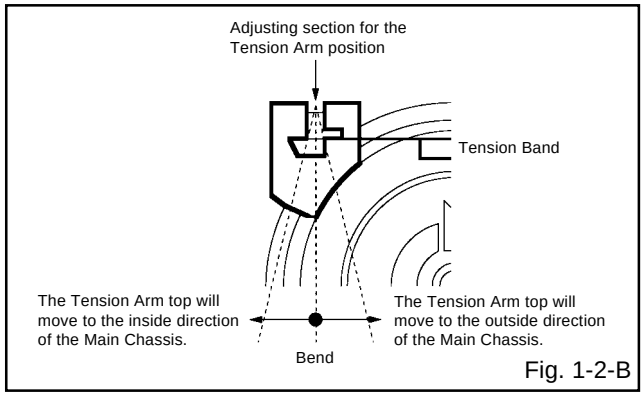


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(KT-300NR)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(KT-300NR)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

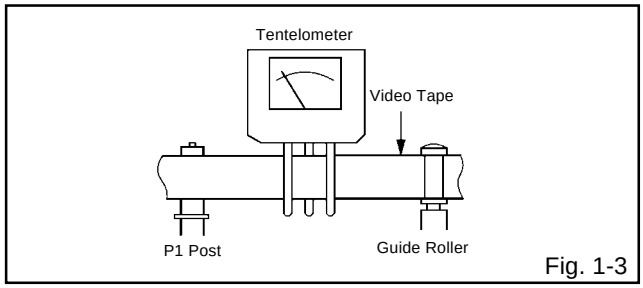


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Picture Search (Rewind) mode. **(Refer to Fig.1-4-B)**
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

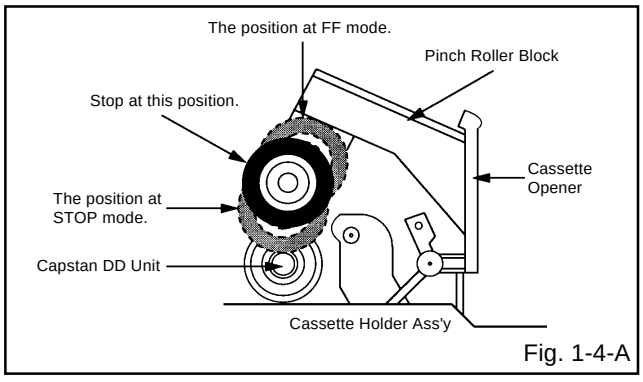


Fig. 1-4-A

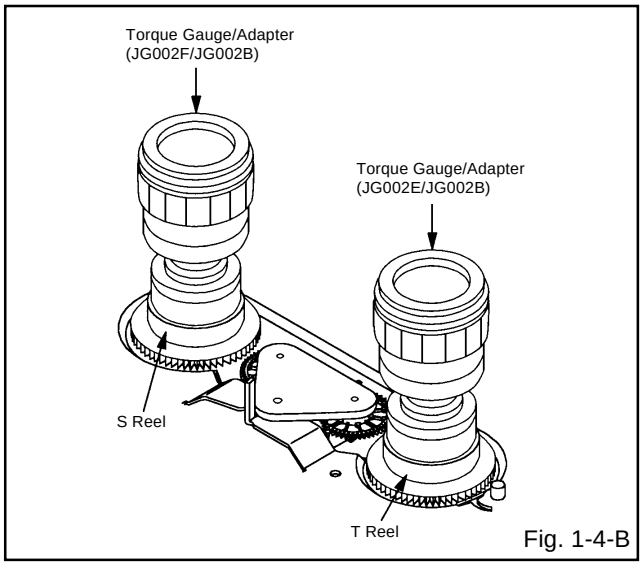


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B**, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. **(Refer to the ELECTRICAL ADJUSTMENTS)**

NOTE

After adjustment, confirm and adjust A/C head. **(Refer to item 2-2)**

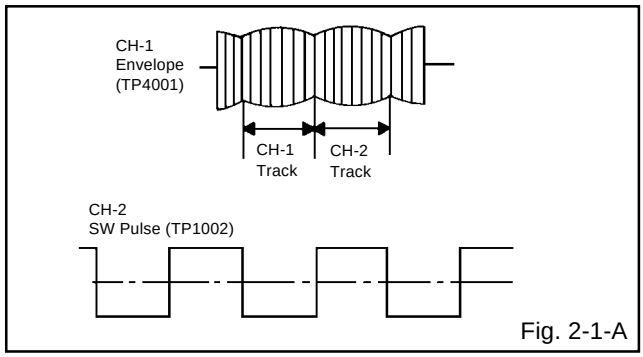


Fig. 2-1-A

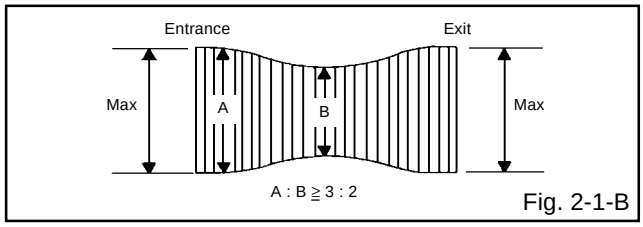


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/ CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

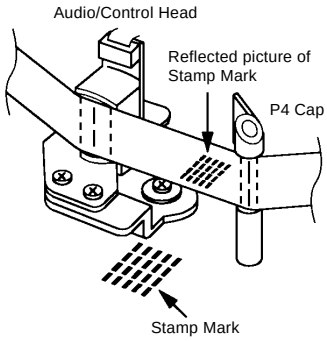


Fig. 2-2-A

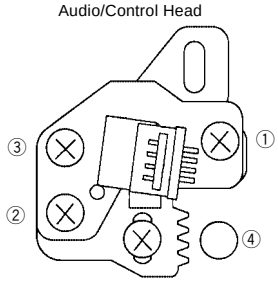


Fig. 2-2-B

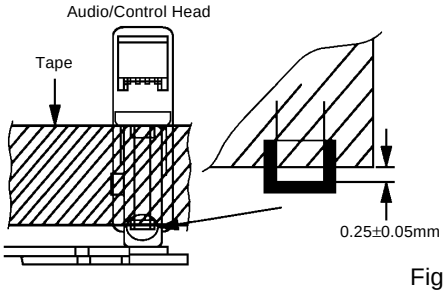


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP1002**, CH-2 to **TP4001** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.

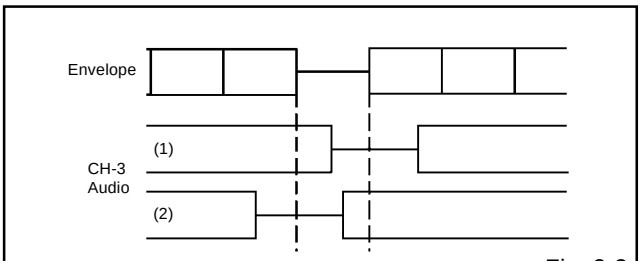
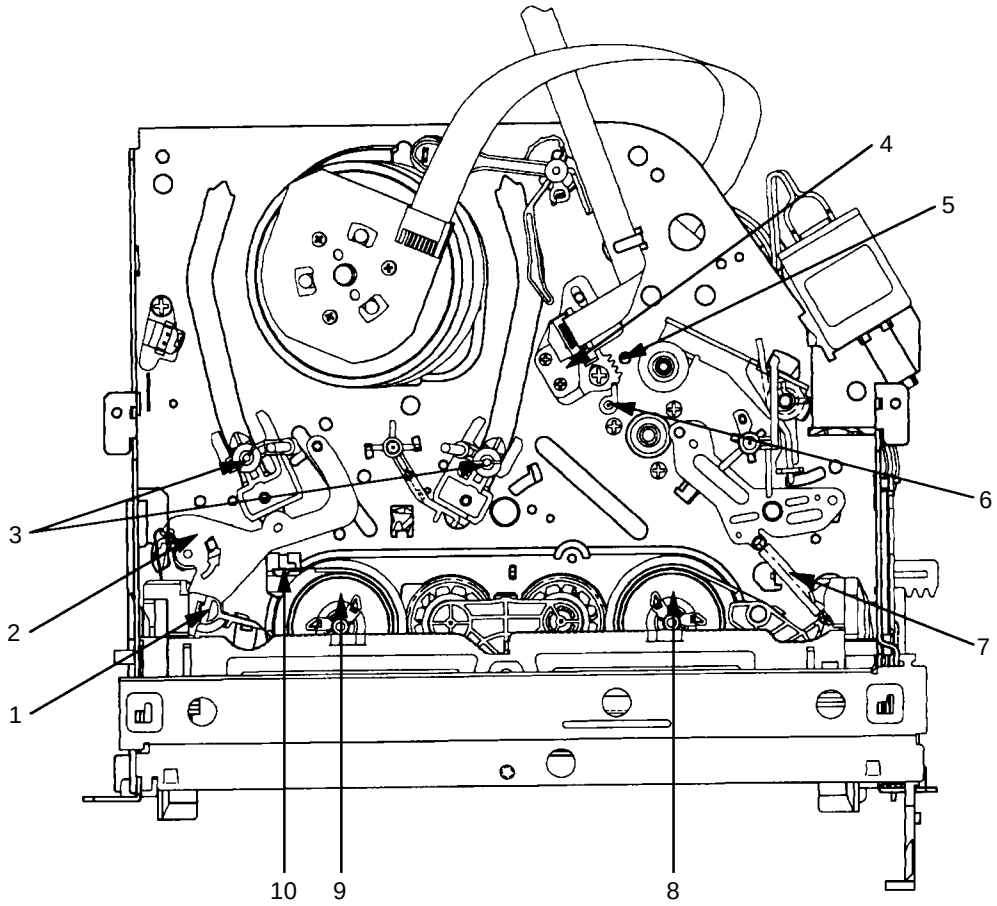


Fig. 2-3

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



1. Tension Connect
2. Tension Arm
3. Guide Roller
4. Audio/Control Head
5. X value adjustment driver hole
6. P4 Post
7. T Brake Spring
8. T Reel
9. S Reel
10. Adjusting section for the Tension Arm position

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control simultaneously to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

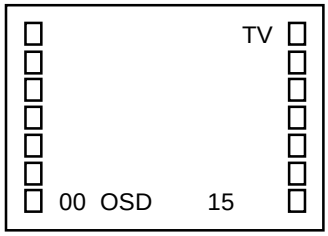


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	13	BRIGHTNESS
01	CUT OFF	14	CONTRAST
02	RF AGC	15	COLOR
03	VIF VCO	16	TINT
04	H VCO	17	SHARPNESS
05	H PHASE	18	FM LEVEL
06	V SIZE	19	---
07	V SHIFT	20	---
08	R DRIVE	21	SEPARATION
09	B DRIVE	22	TEST MONO
10	R CUT OFF	23	TEST STEREO
11	G CUT OFF	24	X-RAY TEST
12	B CUT OFF		

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **TP4201**.
2. Playback the alignment tape.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button **(4)** on the remote control simultaneously and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes 6.5 ± 0.5H.
   (Refer to Fig. 2-1-A, B)
7. Press the Tracking Auto button.

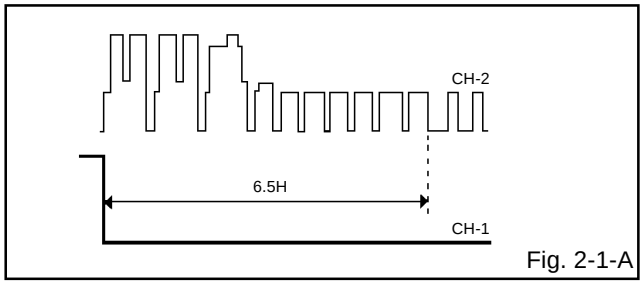


Fig. 2-1-A

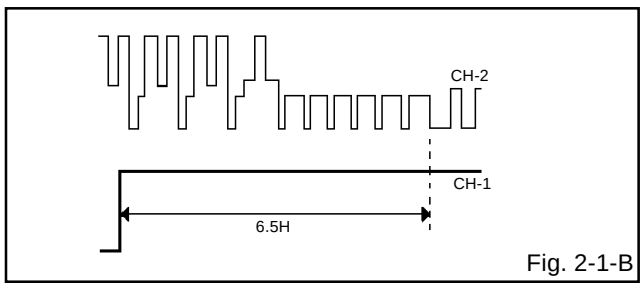


Fig. 2-1-B

2-2: VCO FREERUN

1. Receive the VHF HIGH (63dB).
2. Place the set with Aging Test for more than 10 minutes.
3. Connect the digital voltmeter between the **pin 7 of CP602** and the **pin 1 (GND) of CP602**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "VIF VCO".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5V.

ELECTRICAL ADJUSTMENTS

2-3: RF AGC

1. Receive the VHF HIGH (63dB).
2. Connect the digital voltmeter between the **pin 5 of CP602** and the **pin 1 (GND) of CP602**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF AGC".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5 ± 0.05V.

2-4: STEREO SEPARATION

Please do the method (1) or method (2) adjustment.

Method (1)

1. Set the multi-sound signal generator for each different L-ch and R-ch frequency (Ex. L-ch=2KHz, R-ch=400Hz) and receive the RF.
2. Connect the oscilloscope to the **Audio Out Jack**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select “FM LEVEL”.
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the audio output wave becomes a fine sine wave.

Method (2)

1. Set the multi-sound signal generator L-ch=1KHz, R-ch =Non input and receive the RF.
2. Connect the oscilloscope to the **Audio Out Jack (R-ch)**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select “FM LEVEL”.
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the R-ch output becomes minimum.
6. Set the multi-sound signal generator L-ch=Non input, R-ch=1KHz and receive the RF.
7. Connect the oscilloscope to the **Audio Out Jack (L-ch)**.
8. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select “FM LEVEL”.
10. Press the VOL. UP/DOWN button on the remote control to adjust it until the L-ch output becomes minimum.

(TV SECTION)

2-5: CONSTANT VOLTAGE

1. Connect the digital voltmeter to the **TP501 (R502)**.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Adjust the **VR502** until the digital voltmeter is 115 ± 0.5V.

2-6: CUT OFF

1. Adjust the unit to the following settings.
   R CUT OFF=128, G CUT OFF=128, B CUT OFF=128, R DRIVE=64, B DRIVE=64, BRIGHTNESS=100, CONTRAST=85
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-7: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(10)** on the remote control to select "R CUT OFF".
5. Press the CH. UP/DOWN button on the remote control to select the "R CUT OFF", "G CUT OFF", "B CUT OFF", "R DRIVE" or "G DRIVE".
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R CUT OFF, G CUT OFF, B CUT OFF, R DRIVE, and G DRIVE at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

2-8: FOCUS

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Turn the Focus Volume fully counterclockwise once.
4. Adjust the **Focus Volume** until picture is distinct.

2-9: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H PHASE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-10: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V SHIFT".
4. Check if the step No. V. SHIFT is "0".
5. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask.

ELECTRICAL ADJUSTMENTS

2-11: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes 10 ± 2%.

2-12: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-11. After the adjustment of Vertical Linearity, reconfirm the Vertical Shift and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR402** until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-13: SUB BRIGHTNESS

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRIGHTNESS".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible.
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

2-14: SUB CONTRAST

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(14)** on the remote control to select "CONTRAST".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "85".
3. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 1~2.

2-15: SUB TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP806 (R808)**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line. **(Refer to Fig. 2-2)**
6. Receive the color bar pattern. (Audio Video Input)
7. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

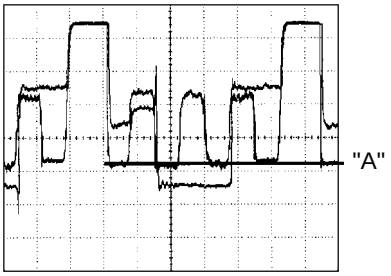


Fig. 2-2

2-16: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP804 (R804)**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(15)** on the remote control to select "COLOR".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110 ± 5% of the white level. **(Refer to Fig. 2-3)**
7. Receive the color bar pattern. (Audio Video Input)
8. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.

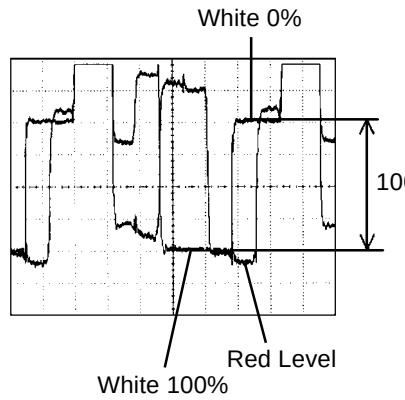


Fig. 2-3

2-17: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-4)**

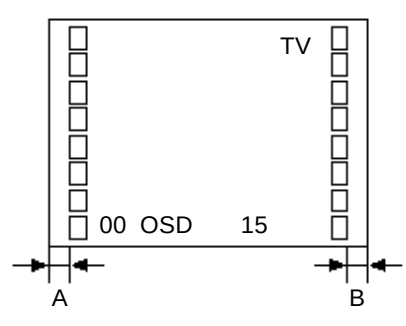


Fig. 2-4

ELECTRICAL ADJUSTMENTS

2-18: SUB SHARPNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "SHARPNESS".
2. Check if the step No. of SHARPNESS is "38".
3. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustment 1~2.

2-19: H. VCO

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "H VCO".
2. Check if the step No. of H VCO is "3".

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

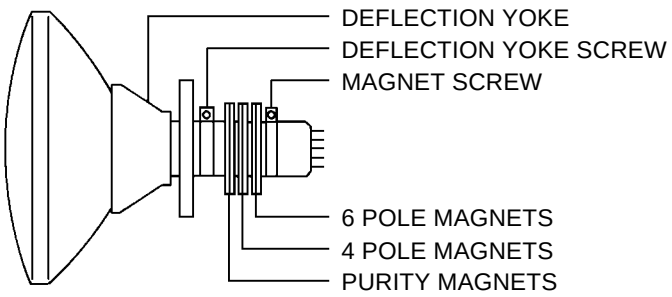


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

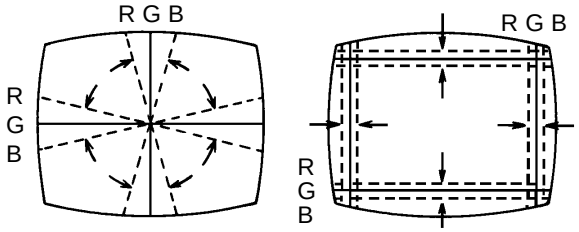
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

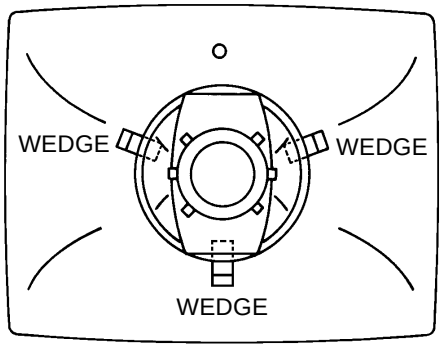
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 3-2-a

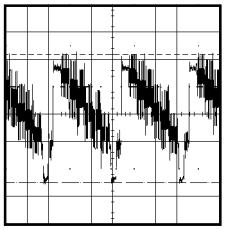


WEDGE POSITION

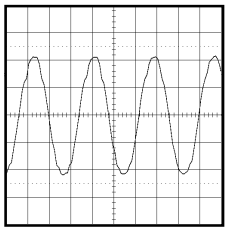
Fig. 3-2-b

WAVEFORMS

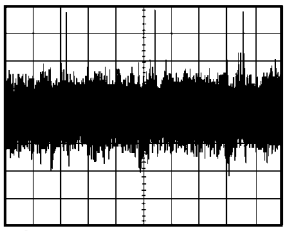
Y/C/AUDIO/CCD/HEAD AMP



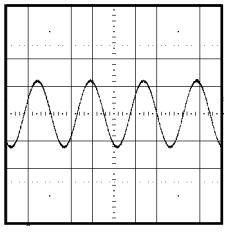
① PB
0.5V 20μs/div



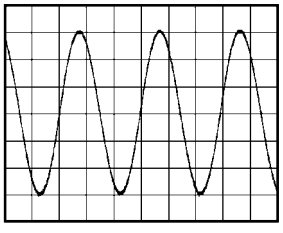
② POWER ON
100mV 0.1μs/div



③ PB
10mV 20us/div

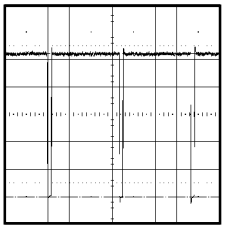


④ PB
0.5V 1ms/div

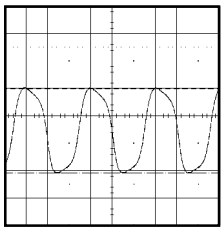


⑤ REC
10.0V 5us/div

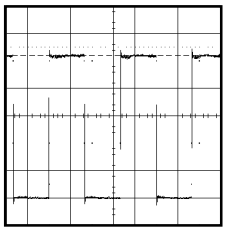
MICON



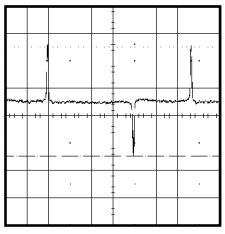
⑦ POWER ON
0.5V 10ms/div



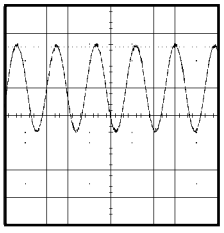
⑧ POWER ON
1.0V 10μs/div



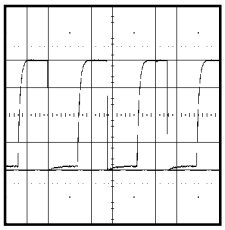
⑨ PB
1.0V 10ms/div



⑩ PB
1.0V 5ms/div

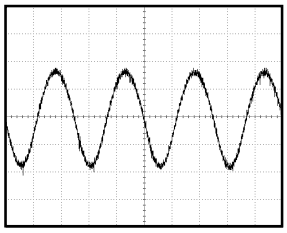


⑪ PB
0.5V 0.5ms/div

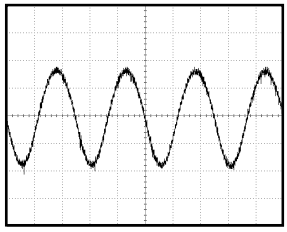


⑫ PB
1.0V 0.5ms/div

HI-FI

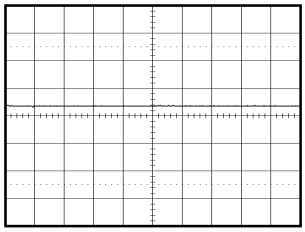


㉒ 200mV 1ms/div



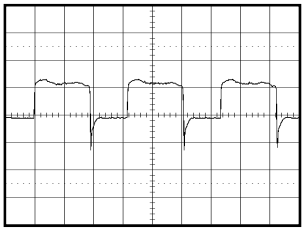
㉓ 200mV 1ms/div

TV POWER



㉔ REC/PB
5V 0.1ms/div

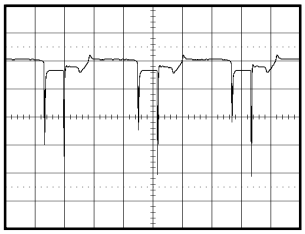
DEFLECTION



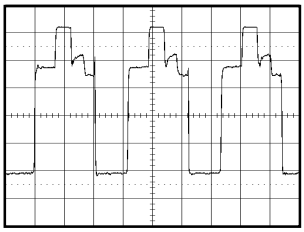
㉕ 0.5V 20μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

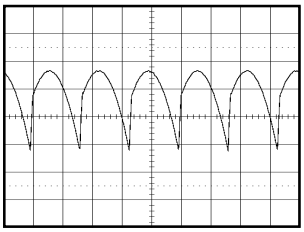
WAVEFORMS



(26) 5V 20µs/div

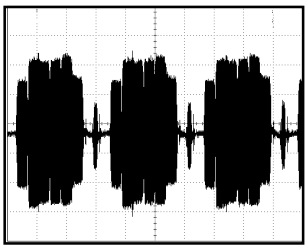


(31) 20.0V 20µs/div

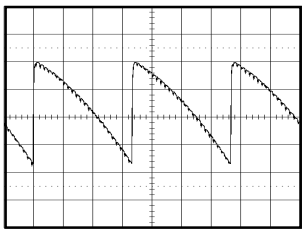


(27) 1V 10ms/div

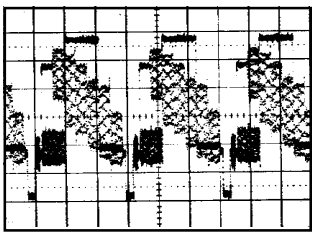
CHROMA/IF



(15) 100mV 20µs/div

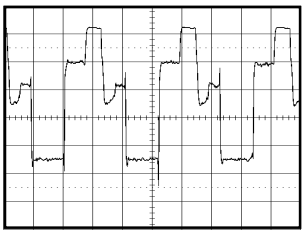


(28) 0.5V 5ms/div

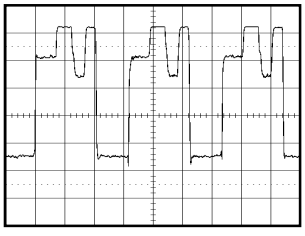


(16) 200mV 20µs/div

CRT



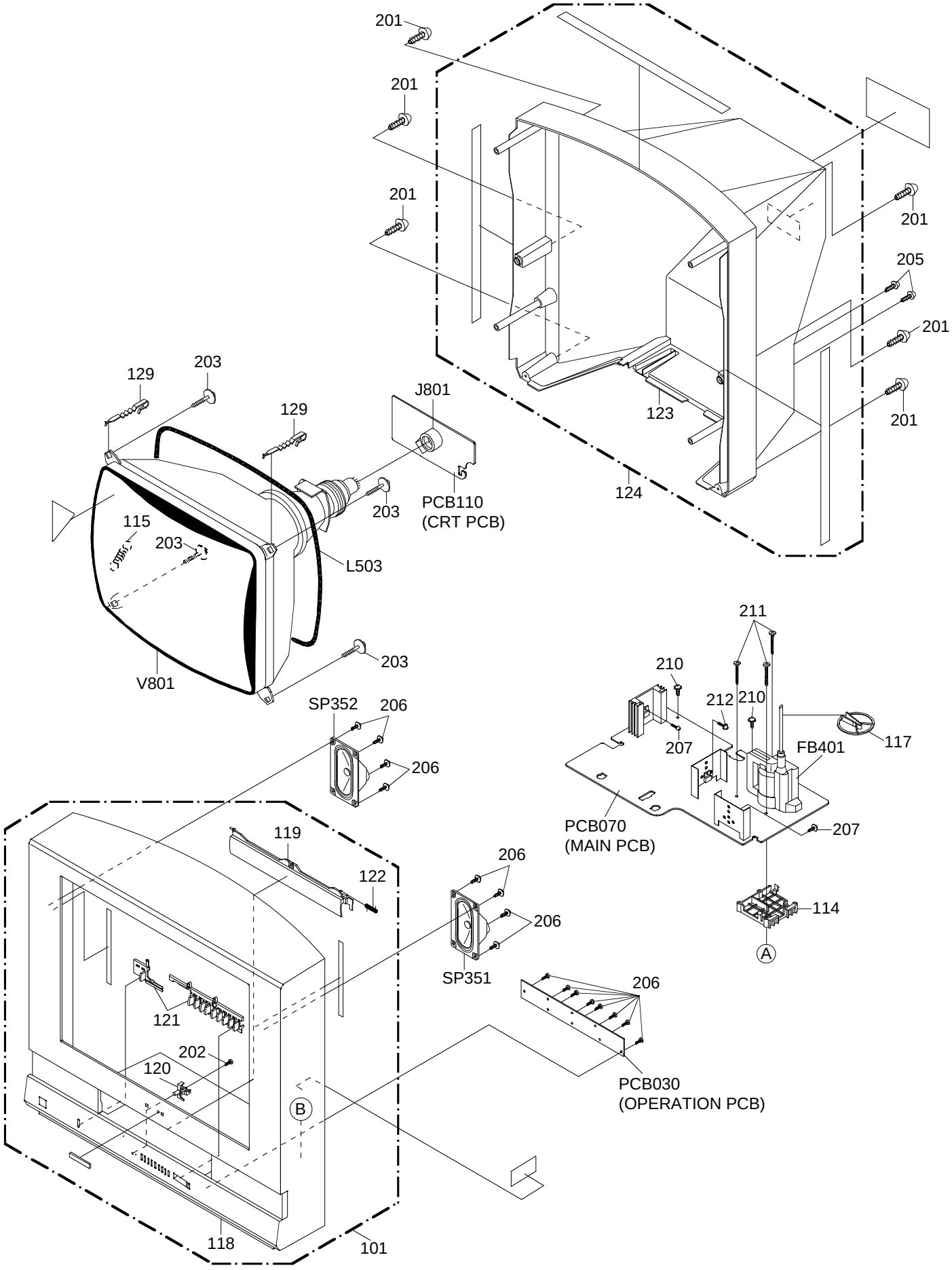
(29) 20.0V 20µs/div



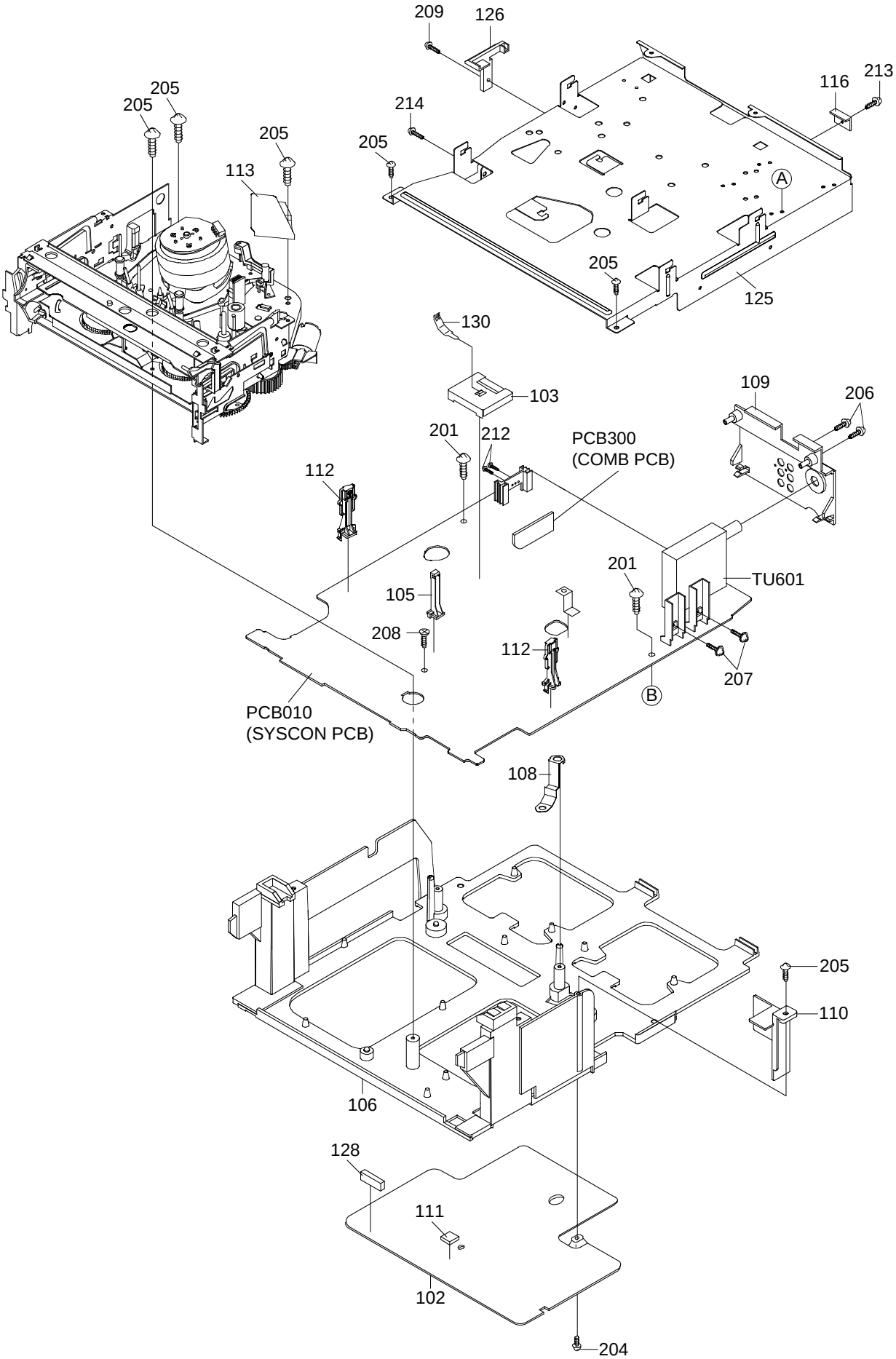
(30) 20.0V 20µs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

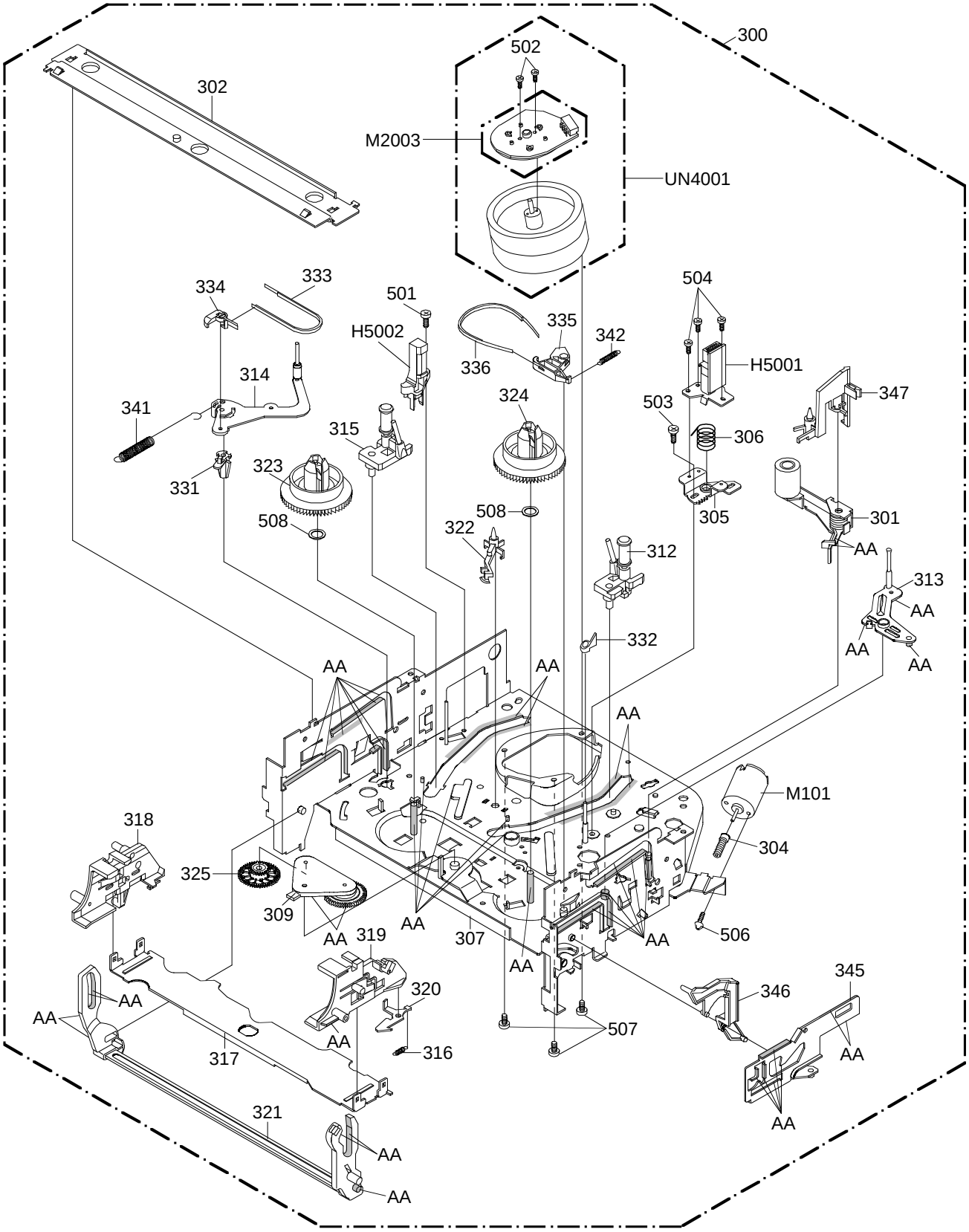
MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW



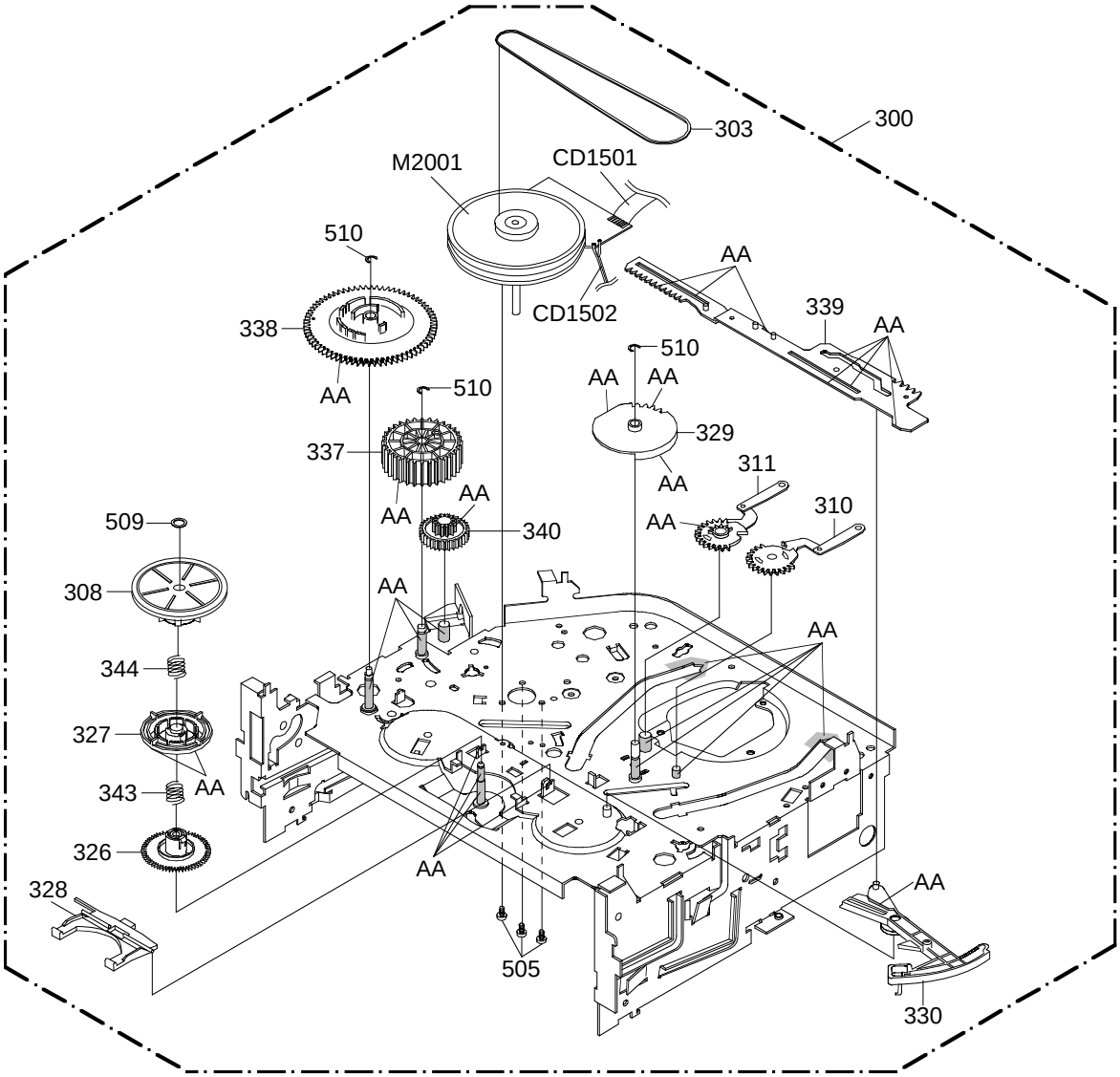
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	BZ310342	A5B4010720	CABINET,FRONT ASSY	
102	BZ710248	752WSAA028	SHIELD,BOTTOM	
103	BZ710466	752WSA0230	SHIELD,CASE HEAD AMP	
105	BZ710497	85OP700037	HOLDER,LED	
106	BZ710631	761WPAA055	HOLDER,DECK	
108	BZ710610	753WSA0144	PLATE,BOTTOM-EARTH	
109	BZ710632	771WPA0272	PLATE,JACK	
110	BZ710508	755WPA0026	PLATE,COVER LIGHT	
111	BZ710252	800WFA0038	CUSHION	10x10xT=2
112	BZ710498	85OP700038	HOLDER,END SENSOR	
113	BZ710633	752WSA0275	COVER,AC HEAD	
114	BZ710459	761WPA0223	HOLDER,FBT	
115	BZ710258	741WUA0001	SPRING,EARTH	
116	BZ710634	761WPA0240	HOLDER,TV-PCB	
117	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
118	BZ710640	701WPJB586	CABINET,FRONT	
119	BZ710641	712WPJB324	FLAP	
120	BZ710455	713WPA0165	GLASS,LED	
121	BZ710642	735WPBA365	BUTTON,FRAME	
122	BZ710010	743WKA0032	SPRING,FLAP	
123	BZ710457	702WPAA169	CABINET,BACK ASS'Y	
124	BZ310350	A5B4010740	CABINET,BACK ASS'Y	
125	BZ710638	752WSA0277	PLATE,DECK SHIELD ASS'Y	
126	BZ710012	761WPA0151	HOLDER,M/PCB	
128	BZ710251	800WFA0037	CUSHION	15x5xT=6
129	BZ710259	762WPA0011	HOLDER,CRT WIRE	
130	BZ710331	753WUAA006	SPRING,EARTH HEAD AMP	
201	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
202	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
203	BZ710275	8121J50B54	SCREW,TAPPING(B0) GW20	5x28
204	BZ710158	8110630604	SCREW,TAP TITE(P) BRAZIER	3x6
205	BZ710032	8110630A24	SCREW,TAP TITE(P) BRAZIER	3x12
206	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
207	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
208	BZ710028	8110330804	SCREW,TAP TITE(P) FLAT	3x8
209	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
210	BZ710337	8107930604	SCREW,CUP(S)	3x6
211	BZ710409	8107630B04	SCREW,TAP TITE(S) BRAZIER	3x20
212	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
213	BZ710147	8107630604	SCREW,TAP TITE(S) BRAZIER	3x6
214	BZ710408	8109630604	SCREW,TAP TITE(B) BRAZIER	3x6
---	BZ710410	792WHA0317	PACKAGE,TOP	
---	BZ710411	792WHA0318	PACKAGE,BOTTOM	
---	BZ710643	793WCDB153	GIFT BOX	
---	BZ614388	J5B40101	INSTRUCTION BOOK	

CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
300	BZ610339	A5B401Z420A	DECK ASSY	A5B401Z420A
301	BZ710564	85OA400234	PINCH ROLLER BLOCK	
302	BZ710514	85OP900746	BRACKET,TOP 3V	
303	BZ710193	85OP200290	BELT,CAPSTAN (S)	
304	BZ710515	85OP600581	WORM	
305	BZ710094	85OP500083	BASE,AC HEAD	
306	BZ710112	85OP800324	SPRING,AC HEAD	
307	BZ710516	85OA000459	MAIN CHASSIS ASS'Y	
308	BZ710517	85OA200089	CLUTCH ASS'Y	
309	BZ710518	85OA200090	ARM IDLER ASS'Y	
310	BZ710519	85OA300065	LOADING ARM S UNIT	
311	BZ710520	85OA300066	LOADING ARM T UNIT	
312	BZ710521	85OA400223	INCLINED BASE T UINT 3S	
313	BZ710522	85OA400232	P5 ARM ASS'Y 2	
314	BZ710523	85OA400233	TENSION ARM ASS'Y (WT)	
315	BZ710524	85OA400231	INCLINED BASE S UNIT	
316	BZ710525	85OP800358	SPRING,LOCKER	
317	BZ710526	85OP900736	CASS,HOLDER	
318	BZ710527	85OP900748	CASS,SIDE L	
319	BZ710528	85OP900749	CASS,SIDE R	
320	BZ710529	85OP900739	LOCKER,R	
321	BZ710530	85OA900228	LINK UNIT	
322	BZ710531	85OP000496	POST,CASS GUIDE	
323	BZ710532	85OP200316	REEL,S (S)	
324	BZ710533	85OP200317	REEL,T (S)	
325	BZ710534	85OP200308	GEAR,IDLER	
326	BZ710535	85OP200311	GEAR,CLUTCH	
327	BZ710536	85OP200312	GEAR,COUPLING	
328	BZ710537	85OP200313	LEVER,CLUTCH	
329	BZ710538	85OP300194	GEAR,MAIN LOADING	
330	BZ710092	85OP400490	LEVER,TENSION	
331	BZ710093	85OP400492	HOLDER,TENSION	
332	BZ710366	85OP400520	CAP.P4	
333	BZ710539	85OP400539	BAND,TENSION	
334	BZ710540	85OP400533	CONNECT,TENSION	
335	BZ710541	85OP600573	ARM,BRAKE T	
336	BZ710542	85OP600583	BAND,BRAKE T	
337	BZ710543	85OP600577	CAM,PINCH ROLLER	
338	BZ710544	85OP600578	CAM,MAIN	
339	BZ710545	85OP600579	ROD,MAIN	
340	BZ710546	85OP600582	GEAR,JOINT	
341	BZ710110	85OP800322	SPRING,TENSION	
342	BZ710547	85OP800360	SPRING,BRAKE T	
343	BZ710548	85OP800355	SPRING,COUPLING	
344	BZ710549	85OP800356	SPRING,RING	
345	BZ710565	85OP900750	LEVER,LINK 2	
346	BZ710551	85OP900744	LEVER,FLAP	
347	BZ710552	85OP900745	CASS,OPENER	
501	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
502	BZ710390	8107226504	SCREW,TAP TITE(S) BIND	2.6x5
503	BZ710371	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
504	BZ710046	8102120604	SCREW,PAN	M2x6
505	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
506	BZ710553	810A130404	SCREW/WASHER(A)	M3x4
507	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
508	BZ710056	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
509	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
510	BZ710058	83ETW30000	E-RING	3.0
CD1501	BZ614338	122H071603	CORD JUMPER	SMCD-7X151
CD1502	BZ614339	122Y021902	CORD JUMPER	2Y021902
H5001	BZ710040	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
H5002	BZ710041	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
⚠ M101	BZ710566	1596P98001	MOTOR (LOADING)	MXN13FB12K3
⚠ M2001	BZ710555	1510S98036	CAPSTAN DD UNIT	F2QVB08
M2003	BZ710391	1589S11015	MICRO MOTOR	I2OAL01
⚠ UN4001	BZ610340	A5B401B500	CYLINDER UNIT ASS'Y	A5B401B500

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		RESISTORS		
⚠R401	BZ210228	R3X28A101J	R,METAL OXIDE	100 OHM 2W
⚠R402	BZ210229	R3X28A151J	R,METAL OXIDE	150 OHM 2W
R408	BZ210239	R00202681J	RC	680 OHM 1/2W
⚠R418	BZ210150	R002T2010J	RC	1 OHM 1/2W
⚠R442	BZ210114	R4X5T6123F	R,METAL	12K OHM 1/6W
⚠R443	BZ210230	R4X5T6332F	R,METAL	3.3K OHM 1/6W
⚠R444	BZ210231	R4X5T6153F	R,METAL	15K OHM 1/6W
⚠R447	BZ210185	R65582151J	R,FUSE	150 OHM 1/2W
R448	BZ210153	R3X181102J	R,METAL OXIDE	1K OHM 1W
⚠R450	BZ210232	R6558A6R8J	R,FUSE	6.8 OHM 2W
R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W
⚠R501	BZ210117	R5X2CE010J	R,CEMENT	1 OHM 7W
⚠R502	BZ210165	R3X18AR56J	R,METAL OXIDE	0.56 OHM 2W
⚠R512	BZ210045	R3X181223J	R,METAL OXIDE	22K OHM 1W
⚠R514	BZ210233	R4X5T6272F	R,METAL	2.7K OHM 1/6W
⚠R527	BZ210234	R3X1810R1J	R,METAL OXIDE	0.1 OHM 1W
⚠R529	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W
⚠R538	BZ210206	R002T2155J	RC	1.5M OHM 1/2W
R693	BZ210235	R00204103J	RC	10K OHM 1/4W
⚠R804	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R806	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R808	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
		CAPACITORS		
⚠C407	BZ110209	E0ELF3222M	CE	2200 UF 25V
C423	BZ110210	P411F3394J	CMPP	0.39 UF 250V ECWF
⚠C428	BZ110211	P4N8FK133H	CMPP	0.013 UF 1.5KV
⚠C431	BZ110204	E0ELFD220M	CE	22 UF 250V
⚠C433	BZ110205	E02LU5220M	CE	22 UF 50V
C450	BZ110182	C03L0R713K	CC	0.001 UF 2KV R
C501	BZ110176	C03L0R7Q2K	CC	470 PF 2KV R
C504	BZ110182	C03L0R713K	CC	0.001 UF 2KV R
⚠C505	BZ110138	P2472B224M	CMP	0.22UF 275V PHE840
⚠C506	BZ110145	P2472B104M	CMP	0.1 UF 275V PHE840
⚠C507	BZ110012	E51CGC471M	CE	470 UF 200V
C517	BZ110181	C03L0R7H3K	CC	0.0022UF 2KV R
⚠C518	BZ110206	C0JTB05Q2K	CC	470 PF 500V B
⚠C520	BZ110207	E02LT2102M	CE	1000 UF 16V
⚠C521	BZ110130	E62NFC221M	CE	220 UF 200V
⚠C523	BZ110029	E5EZT3471M	CE	470 UF 25V
⚠C524	BZ110053	E02LF3102M	CE	1000 UF 25V
⚠C529	BZ110051	CB3930MH3M	CC	0.0022UF 250V
⚠C530	BZ110051	CB3930M13M	CC	0.001 UF 250V
⚠C531	BZ110129	E5EZF2222M	CE	2200 UF 16V
⚠C533	BZ110051	CB3930M13M	CC	0.001 UF 250V
C540	BZ110191	C03L0R7E3K	CC	0.0015UF 2KV R
C741	BZ110208	E02L052R2M	CE	2.2 UF 50V
C808	BZ110182	C03L0R713K	CC	0.001 UF 2KV R
		DIODES		
D401	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D402	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D405	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D406	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D407	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
⚠D409	BZ410017	D94TA11B13	DIODE,ZENER	HZ11B3L TD
D410	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
⚠D411	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
⚠D412	BZ410014	D2LTPG06J0	DIODE,SILICON	RMPG06J-G3
⚠D413	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
⚠D501	BZ410044	D4LZBL06L0	DIODE	GBL06L-6177
D504	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
⚠D505	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
D506	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
D507	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D508	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
⚠D509	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
⚠D510	BZ410080	D2WXRU2AM0	DIODE,SILICON	RU2AM-EIC
⚠D512	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
⚠D514	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
⚠D515	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D516	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D517	BZ410090	D97U04R71B	DIODE,ZENER	MTZJ4.7B T-77
⚠D519	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
⚠D523	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
D524	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D525	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D526	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description		
		DIODES			
D533	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D601	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D602	BZ410053	D97U08R21C	DIODE,ZENER	MTZJ8.2C T-77	
D603	BZ410084	D97U01101B	DIODE,ZENER	MTZJ11B T-77	
D604	BZ410008	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3	
D605	BZ410025	D28T11ESN1	DIODE,SILICON	11ES1N-TA1B2	
D606	BZ410084	D97U01101B	DIODE,ZENER	MTZJ11B T-77	
D607	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D608	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	
D609	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	
D612	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	
D613	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	
D616	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D617	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D618	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D619	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D620	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D621	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D791	BZ410054	0021721150	LED	SLR-342VCT32	
D793	BZ410054	0021721150	LED	SLR-342VCT32	
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D1001	BZ410084	D97U01101B	DIODE,ZENER	MTZJ11B T-77	
D1002	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D1003	BZ410095	0010100320	INFRARED LED	LNA2702L010R	
D1014	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	
D2201	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	
D4003	BZ410034	D97U01301B	DIODE,ZENER	MTZJ13B T-77	
D4201	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	
D4204	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D4205	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D4206	BZ410034	D97U01301B	DIODE,ZENER	MTZJ13B T-77	
D5501	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
		ICS			
IC301	BZ611034	I06DF62420	IC	M62420SP	
IC352	BZ611035	I0FSP75220	IC	AN7522	
⚠IC401	BZ611025	I03TD80400	IC	LA78040	
⚠IC501	BZ611097	I0WD015070	IC	TEA1507P/N1	
⚠IC506	BZ410088	0002E00610	PHOTO COUPLER	LTV-817M-VB	
IC601	BZ611055	I06FC61206	IC	M61206FP	
⚠IC602	BZ611089	I1KA98R09A	IC	KIA78R09API	
⚠IC603	BZ611054	I1KA98R050	IC	KIA78R05PI	
IC901	BZ611079	I05FE90A45	IC	TC90A45F	
IC1001	BZ611093	I56F57071A	IC	OEC7071A	
IC1002	BZ611057	IC7J0311A0	IC	R3111N311A/C-TR	
IC1099	BZ610331	A5B401Z015	IC	S-24C04BDP-LA	
IC4001	BZ611095	I03F3205M0	IC	LA71205M-MPB	
IC5501	BZ611024	I01F62FBP0	IC	AN3662FBP	
		TRANSISTORS			
Q350	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q403	BZ510078	TNATJ03003	COMPOUND TRANSISTOR	KRC111MAT	
Q404	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)	
⚠Q405	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT	
⚠Q406	BZ510028	TDUF024990	TRANSISTOR,SILICON	2SD2499	
⚠Q501	BZ510098	T220033260	FET	2SK3326(2)	
Q502	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA	
⚠Q503	BZ510005	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE	
Q504	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
Q505	BZ510011	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA	
Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
Q601	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
⚠Q602	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT	
⚠Q603	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT	
Q604	BZ510090	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK	
⚠Q605	BZ510043	TC10013840	TRANSISTOR,SILICON	2SC13840W	
⚠Q606	BZ510043	TC10013840	TRANSISTOR,SILICON	2SC13840W	
⚠Q608	BZ510043	TC10013840	TRANSISTOR,SILICON	2SC13840W	
Q609	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q651	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q801	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)	or
	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC	
⚠Q802	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)	or
	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC	
⚠Q803	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)	or
	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC	
Q810	BZ510080	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP TP	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description		
		TRANSISTORS			
Q811	BZ510080	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP TP	
Q812	BZ510080	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP TP	
Q901	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q902	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q903	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q1002	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L	
Q1003	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N	or
	BZ410096	0002700670	PHOTO COUPLER	RPI-352Q02	
Q1004	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q1005	BZ410107	0002700690	PHOTO COUPLER	RPI-303	or
	BZ410049	0002700590	PHOTO COUPLER	RPI-301	
Q1006	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q1007	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q1008	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q1009	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N	or
	BZ410096	0002700670	PHOTO COUPLER	RPI-352Q02	
Q1013	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L	
Q1014	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q4001	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
Q4002	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
Q4003	BZ510072	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK	
Q4005	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)	
Q4006	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT	
Q4007	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4009	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4010	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4012	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4013	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4203	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4205	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q4206	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q4210	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4211	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4212	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q5501	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
		COILS &TRANSFORMERS			
L301	BZ310002	021673101K	COIL	100 UH	
L302	BZ310005	02167D101K	COIL	100 UH	
L401	BZ310004	021679472K	COIL	4.7 MH	
L402	BZ310063	022100027A	COIL,LINEARITY	ELH5L4113	
⚠L501	BZ310115	029T000093	COIL,LINE FILTER	1R5A472F24	
⚠L503	BZ310066	028R200024	COIL,DEGAUSS	8R200024	
L601	BZ310169	021LA6R39M	COIL	0.39 UH	
L604	BZ310041	02167F101J	COIL	100 UH	
L607	BZ310052	021LA6100K	COIL	10 UH	
L608	BZ310041	02167F101J	COIL	100 UH	
L610	BZ310156	021375101K	COIL	100 UH	
L613	BZ310136	021LA63R3K	COIL	3.3 UH	
L618	BZ310117	021LA6330K	COIL	33 UH	
L620	BZ310029	021LA6470K	COIL	47 UH	
L801	BZ310002	021673101K	COIL	100 UH	
L802	BZ310070	02167D820K	COIL	82 UH	
L804	BZ310070	02167D820K	COIL	82 UH	
L901	BZ310138	021673821K	COIL	820 UH	
L902	BZ310170	021673151K	COIL	150 UH	
L903	BZ310140	02167F150J	COIL	15 UH	
L904	BZ310141	02167F100J	COIL	10 UH	
L1001	BZ310009	021LA62R2K	COIL	2.2 UH	
L4001	BZ310039	02167F220J	COIL	22 UH	
L4003	BZ310041	02167F101J	COIL	100 UH	
L4004	BZ310039	02167F220J	COIL	22 UH	
L4005	BZ310040	02167F470J	COIL	47 UH	
L4006	BZ310040	02167F470J	COIL	47 UH	
L4007	BZ310171	032623004T	COIL,TRAP	STP-01064	or
	BZ310024	0326230038	COIL,TRAP	2623003	
L4008	BZ310041	02167F101J	COIL	100 UH	
L4009	BZ310039	02167F220J	COIL	22 UH	
L4205	BZ310041	02167F101J	COIL	100 UH	
L5501	BZ310002	021673101K	COIL	100 UH	
L5503	BZ310071	021LA6820K	COIL,TRAP	82 UH	
L5506	BZ310041	02167F101J	COIL	100 UH	
T401	BZ310172	045013003J	TRANS,HORIZONTAL DRIVE	ETH14Y47AY	
⚠T501	BZ310173	0481350774	TRANSFORMER,SWITCHING	81350774	
T4001	BZ310114	031626009R	COIL,BIAS OSC	1626009	
		JACKS			
⚠J351	BZ614002	060G131014	RCA JACK	HTJ-035-28A	
J701	BZ614114	0602431013	RCA JACK	JPJ1187-010010	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description		
		JACKS			
J801	BZ614115	066C130017	SOCKET,CATHODE RAY TUBE	CVT3275-5101	
J4201	BZ614203	060Q431018	RCA JACK	AV3-19DS-1	
J4202	BZ614204	060Q411015	RCA JACK	AV3-19D-1	
		SWITCHES			
SW751	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW791	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW792	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW793	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW794	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW795	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW796	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW797	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW798	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW799	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW1001	BZ612014	0508A11002	SWITCH(LEAF)	MXS01380MPP0	
		VARIABLE RESISTORS			
VR401	BZ210237	V1K63Q4BTE	VOLUME,SEMI FIXED	NVG6TLTAB473	
VR402	BZ210238	V1K6313BTE	VOLUME,SEMI FIXED	NVG6TLTAB102	
VR502	BZ210238	V1K6313BTE	VOLUME,SEMI FIXED	NVG6TLTAB102	
		P.C.BOARD ASSEMBLIES			
PCB010	BZ310343	A5B4020010	PCB ASS'Y	VMA245B	
PCB030	BZ610333	A5B402Z030	PCB ASS'Y	TEXA33C	
PCB070	BZ310345	A5B4020070	PCB ASS'Y	TMA524A	
PCB110	BZ310346	A5B4020110	PCB ASS'Y	TCA382A	
PCB300	BZ310347	A5B4020300	PCB ASS'Y	VEA975B	
		MISCELLANEOUS			
B301	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B502	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2	
BL001	BZ310174	023V000009	COIL,BALUN	WEV1020-9004	
CD355	BZ614205	06CU123201	CORD,CONNECTOR	CU123201	
CD356	BZ614205	06CU123201	CORD,CONNECTOR	CU123201	
CD402	BZ614066	06CH01004A	CORD,CONNECTOR	CH01004A	
⚠CD501	BZ614341	120R414903	CORD,AC BUSH	0R414903	
CD506	BZ614377	069X620009	CONNECTOR	JM-2W-96	
CD604	BZ614059	06CH01006A	CORD,CONNECTOR	CH01006A	
CD702	BZ614206	06CU2B2801	CORD,CONNECTOR	CU2B2801	
CD757	BZ614207	06CU2A2501	CORD,CONNECTOR	CU2A2501	
CD802	BZ614378	06CU823001	CORD,CONNECTOR	CU823001	
CD803	BZ614384	WDL6030038	FLAT CABLE AWM2468 A	WG26 6C BLACK 300MM	
CD805	BZ614385	WCL6838038	FLAT CABLE AWM2468 A	WG26 5C GRAY 380MM	
CD810	BZ614386	WHL6030038	FLAT CABLE AWM2468 A	WG26 10C BLACK 300MM	
CD820	BZ614387	WLL6826038	FLAT CABLE AWM2468 A	WG26 13C GRAY 260MM	
CF601	BZ613031	1029045R7G	FILTER,SAW	TSF5229P3	
CF603	BZ613015	1011T4R504	FILTER,CERAMIC	EFCT4R5YS5A	
CF604	BZ613016	1011T4R517	FILTER,CERAMIC	EFCT4R5MW5	
⚠CP401	BZ614303	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P	
CP403	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100	
⚠CP502	BZ614283	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P	
CP506	BZ614379	069X620090	CONNECTOR PCB SIDE	RF-H022TD-1190	
CP601	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100	
CP602	BZ614380	069X170379	CONNECTOR PCB SIDE	07JQ-ST	
CP604	BZ614285	069J160038	CONNECTOR PCB SIDE	IMSA-9130B-06	
CP802	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P	
CP805	BZ614212	069R250589	CONNECTOR PCB SIDE	52147-0510	
CY901	BZ614284	069J160048	CONNECTOR PCB SIDE	IMSA-9130S-06L	
CD4001	BZ614373	122F061502	CORD,JUMPER	2F061502	
CP1001	BZ614289	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2	
CP2201	BZ614213	069S2A0629	CONNECTOR PCB SIDE	A2001WV2-10P	
CP4001	BZ614011	0697290620	CONNECTOR PCB SIDE	TOC-C09X-A1	
CP4002	BZ614050	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14	
CP4003	BZ614009	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1	
CP4202	BZ614214	069S2B0629	CONNECTOR PCB SIDE	A2001WV2-11P	
CP803A	BZ614333	067U006049	WIRE HOLDER	B2013H02-6P	
CP803B	BZ614333	067U006049	WIRE HOLDER	B2013H02-6P	
CP805B	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P	
CP810A	BZ614274	069R2A0589	CONNECTOR PCB SIDE	52147-1010	
CP810B	BZ614332	067U011029	WIRE HOLDER	B2013H02-11P	
CP820A	BZ614218	069R2D0589	CONNECTOR PCB SIDE	52147-1310	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		MISCELLANEOUS		
CP820B	BZ614304	067U013029	WIRE HOLDER	B2013H02-13P
CUS011	BZ710279	800WFAA006	CUSHION A	
CUS012	BZ710148	800WFAA007	CUSHION B	
CUS013	BZ710149	800WFAA008	CUSHION C	
EL001	BZ614043	124116281A	EYE LET	XRY16X28BD
EL002	BZ614044	124120301A	EYE LET	XRY20X30BD
⚠F501	BZ614177	081PC05004	FUSE	51MS050LCC
⚠FB401	BZ310175	043220054R	TRANSFORMER,FLYBACK	3220054R
FH501	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
OS753	BZ614127	077Q000019	REMOTE RECEIVER	PIC-28143TC5
PH001	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
PH002	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
⚠RY501	BZ612009	0560V20115	RELAY	ALKS321
SP351	BZ614381	070C546004	SPEAKER	C109-410-149A
SP352	BZ614381	070C546004	SPEAKER	C109-410-149A
⚠TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
TM101	BZ614312	076D0DQ040	TRANSMITTER	TOT201N06050
TU601	BZ310341	0145K00056	TUNER,VHF-UHF	TECC1040PG32E
⚠V801	BZ614382	098W210438	CRT W/DY	A51LVV896X01(O)
X602	BZ613004	100CT3R505	CRYSTAL	HC-49/C
X1001	BZ613002	100CT01207	CRYSTAL	HC-49/U-S
X1002	BZ613006	100DA32R01	CRYSTAL	DT-26
X4001	BZ613017	100CT3R502	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

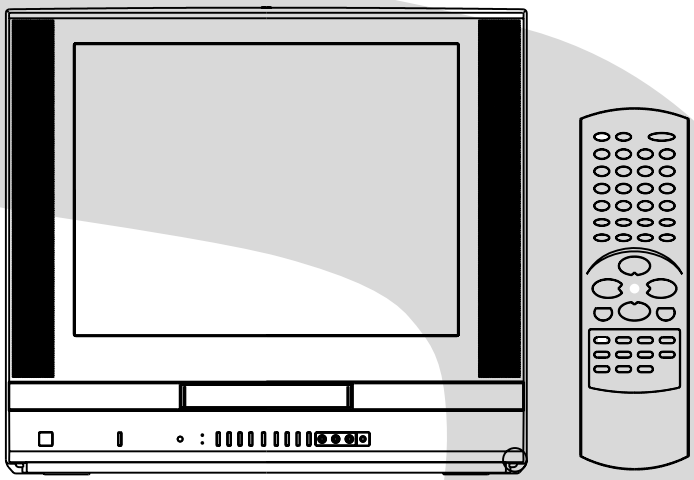
TOSHIBA

FILE NO. 140-200208

SERVICE MANUAL

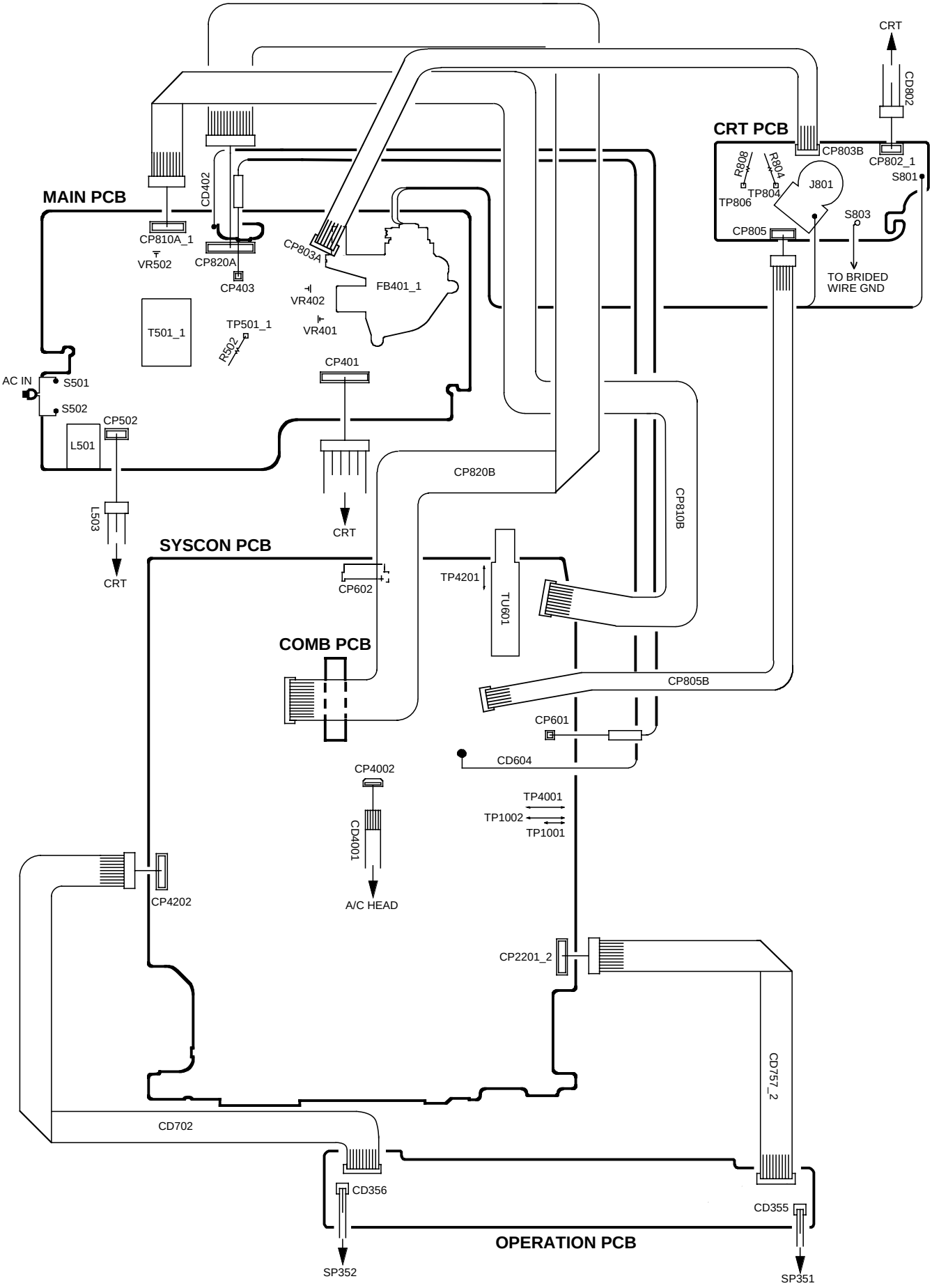
COLOR TELEVISION/ VIDEO CASSETTE RECORDER

MV20FM3



ELECTRICAL ADJUSTMENTS

4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



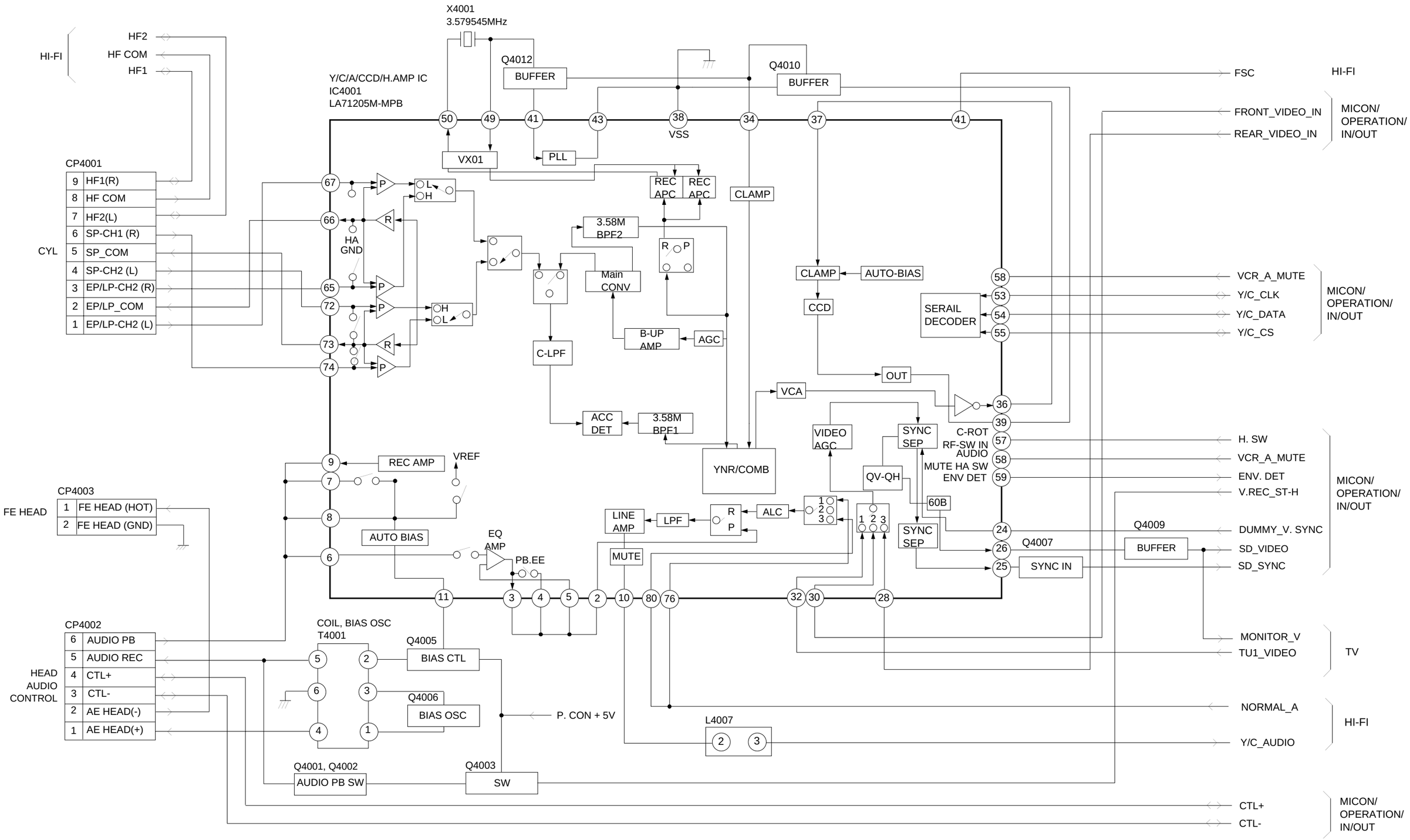
TV BLOCK DIAGRAM

MICON/ OPERATION/ IN/OUT
SCL
SDA
UNGER+8V
Q602, Q603
REG
AT+5V
Q608
REG
P.CON+8V
HI-FI
TU1_AUDIO_A
AT+13V
Q605, Q606
REG
P.CON+5V
Y/C/AUDIO/CCD/ HEAD AMP/
TU1_VIDEO
TU601
1
4
5
11
SAW FILTER
CF601
1
4
5
CHROMA
IC601 M61206FP
57
55
41
33
39
13
50
62
64
1
60
AFT OUT
31
VIF VIDEO OUT
VREG Vcc
5.7V REG OUT
8.7VREF
5v REG
POWER ON CONT
SDA 10
SCL 5
FAST BLK 27
R OUT 14
G OUT 15
B OUT 16
V OUT 17
V PULSE OUT 29
R IN 30
G IN 28
B IN 20
Y/C/AUDIO/ CCD/HEAD AMP
MONITOR_V
Q901
BUFFER
DIGITAL COMB FILTER
IC901 TC90A45F
4
13
15
TV/Y IN
36
34
32
12
6
7
H.PLUSE OUT
FBP IN
Q903
BUFFER
Q902
BUFFER
X602
3.579545MHz
Q403, Q404
SW.
V. OUTPUT IC401 LA78040
THERMAL PROTECTION
AMP
PUMP UP
VCC
1
2
3
5
7
Q651
SW.
H-CONTROL
MICON/ OPERATION/ IN/OUT
Q405
H-DRIVE
Q406
H. OUTPUT
DY
FB401
3
E27
2
+B
COL 1
HV
7
ABL
9
AFC
10
HEATER
F
S
J801
F
7
11
8
6
10
V801
CRT
Q803, Q812
BLUE AMP
Q801, Q810
RED AMP
Q802, Q811
GREEN AMP
P. CON + 8V
HI-FI
AUDIO_OUT_R
AUDIO_OUT_L
DIGITAL SOUND CONTROL
IC301 M62420SP
9
10
2
7
19
14
IC602
KIA78R09API
9V REG
IC603
KIA78R05PI
5V REG
P.CON + 9V
P.CON + 5V
Q502
PROTECT DRIVE
X_RAY_TEST
VD
HD
OSD_BLK
OSD_B
OSD_R
OSD_G
AFT_M
MICON/ OPERATION/ IN/OUT
SOUND AMP
IC352 AN7522
6
1
8
2
4
12
10
5
9
SP352
SPEAKER
SP351
SPEAKER
HEADPHONE
JACK J351
L503
DEGAUSS COIL
AC IN
F501
D501
RECTIFIER
T501
8
9
5
13
11
15
Q501
POWER
POWER CONTROL
IC501
TEA1507P/N1
FEED BACK
IC506
LTV-817M-VB
Q507
FEED BACK SW.
VR502
+B ADJ
UNREG + 8V
Q503
SWITCHING
Q505
SWITCHING
AT + 30V
POWER FAIL
VCR_POWER-H
TV_POWER-H
TV_A_MUTE
MICON/ OPERATION/ IN/OUT

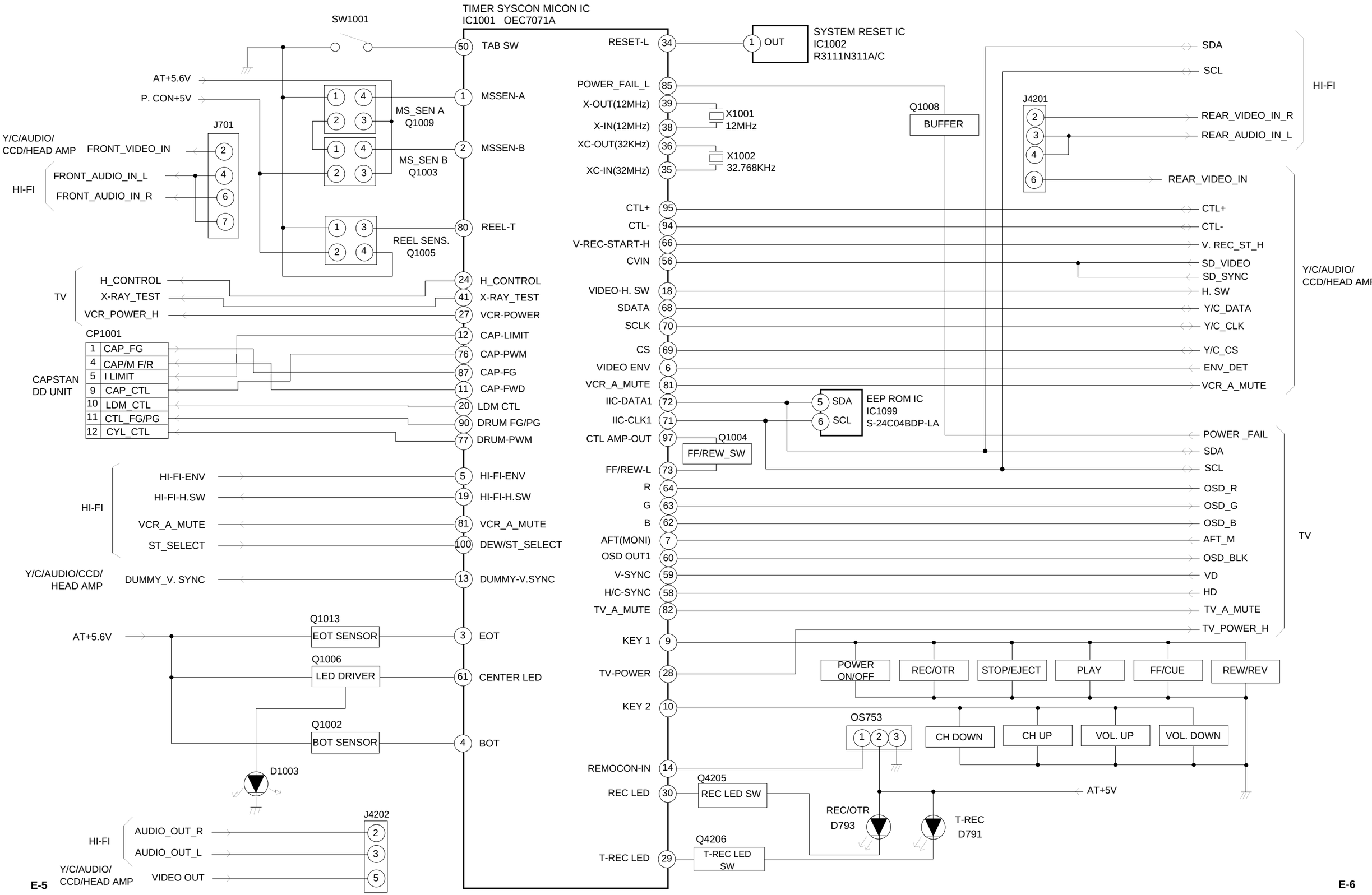
E-1

E-2

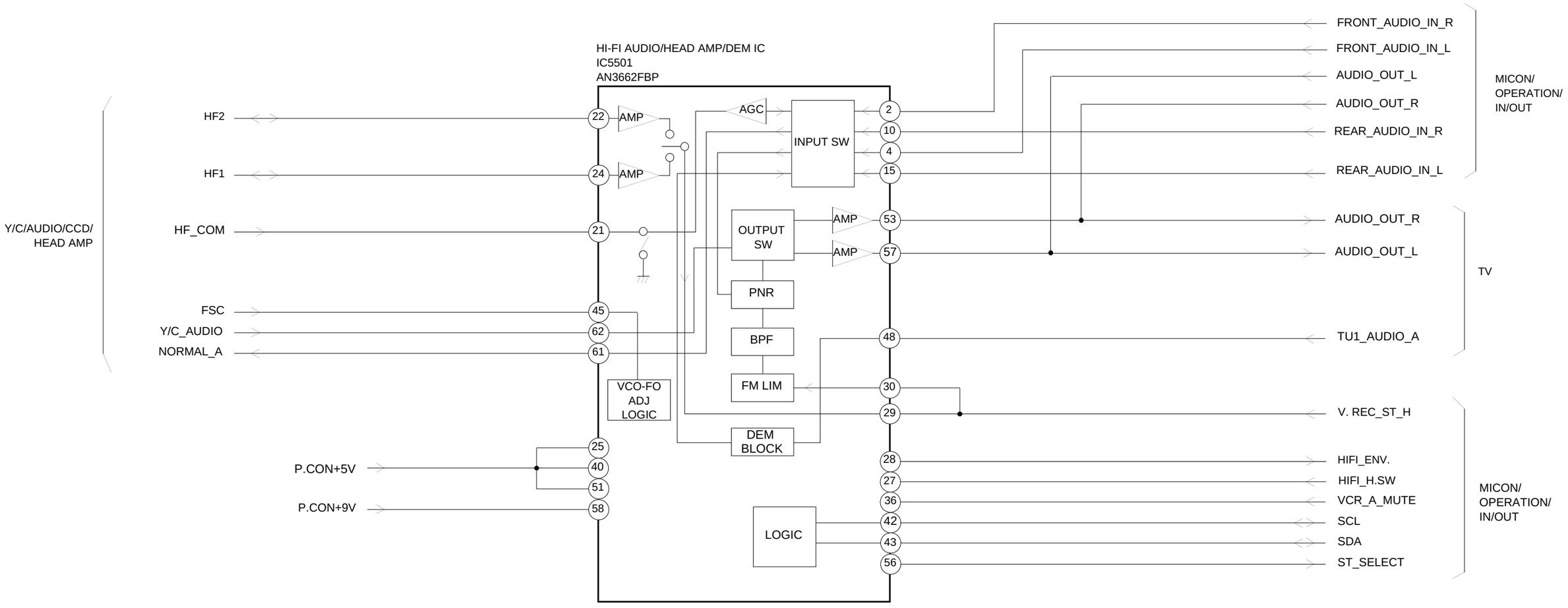
Y/C/AUDIO/CCD/HEAD AMP BLOCK DIAGRAM



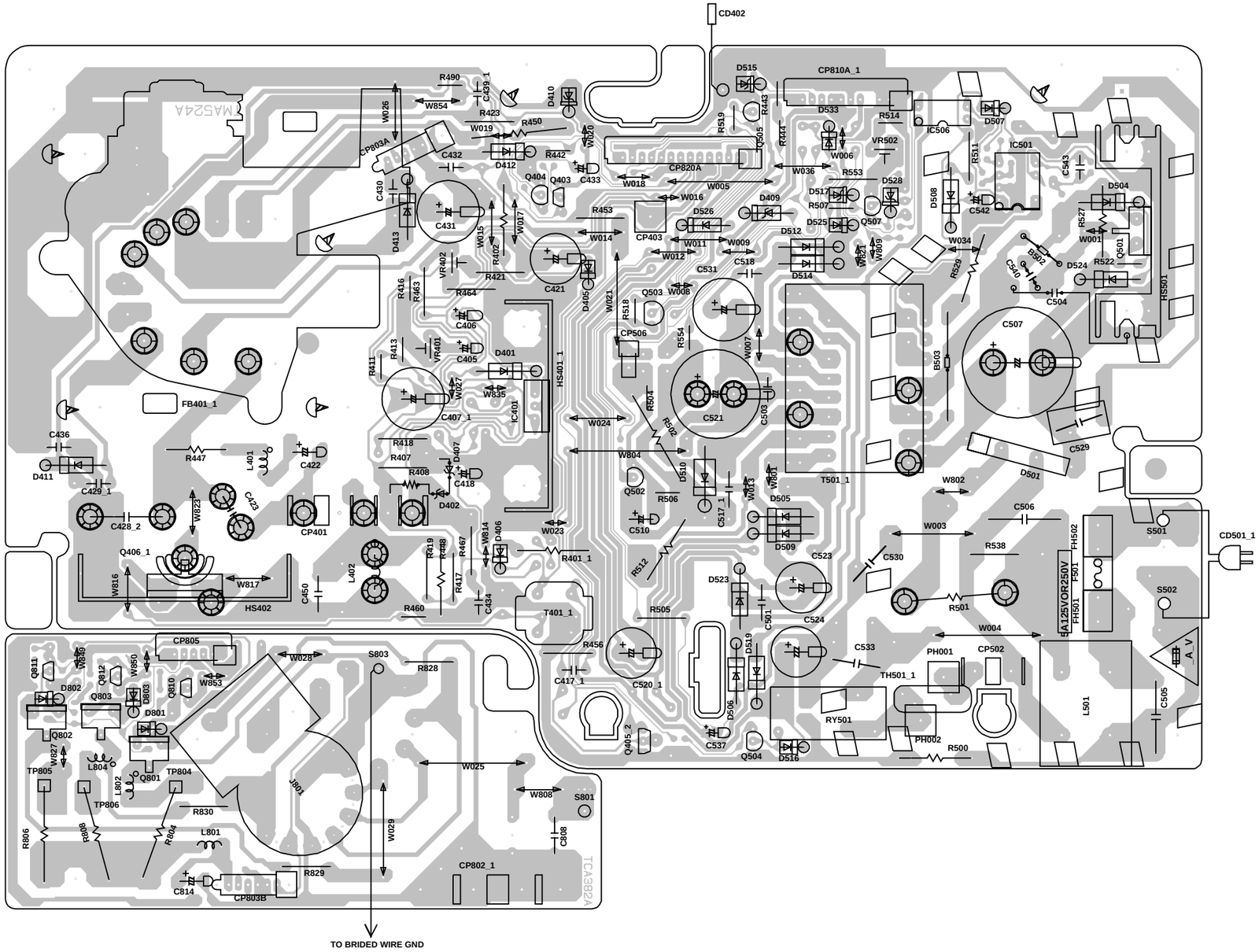
MICON/OPERATION/IN/OUT BLOCK DIAGRAM



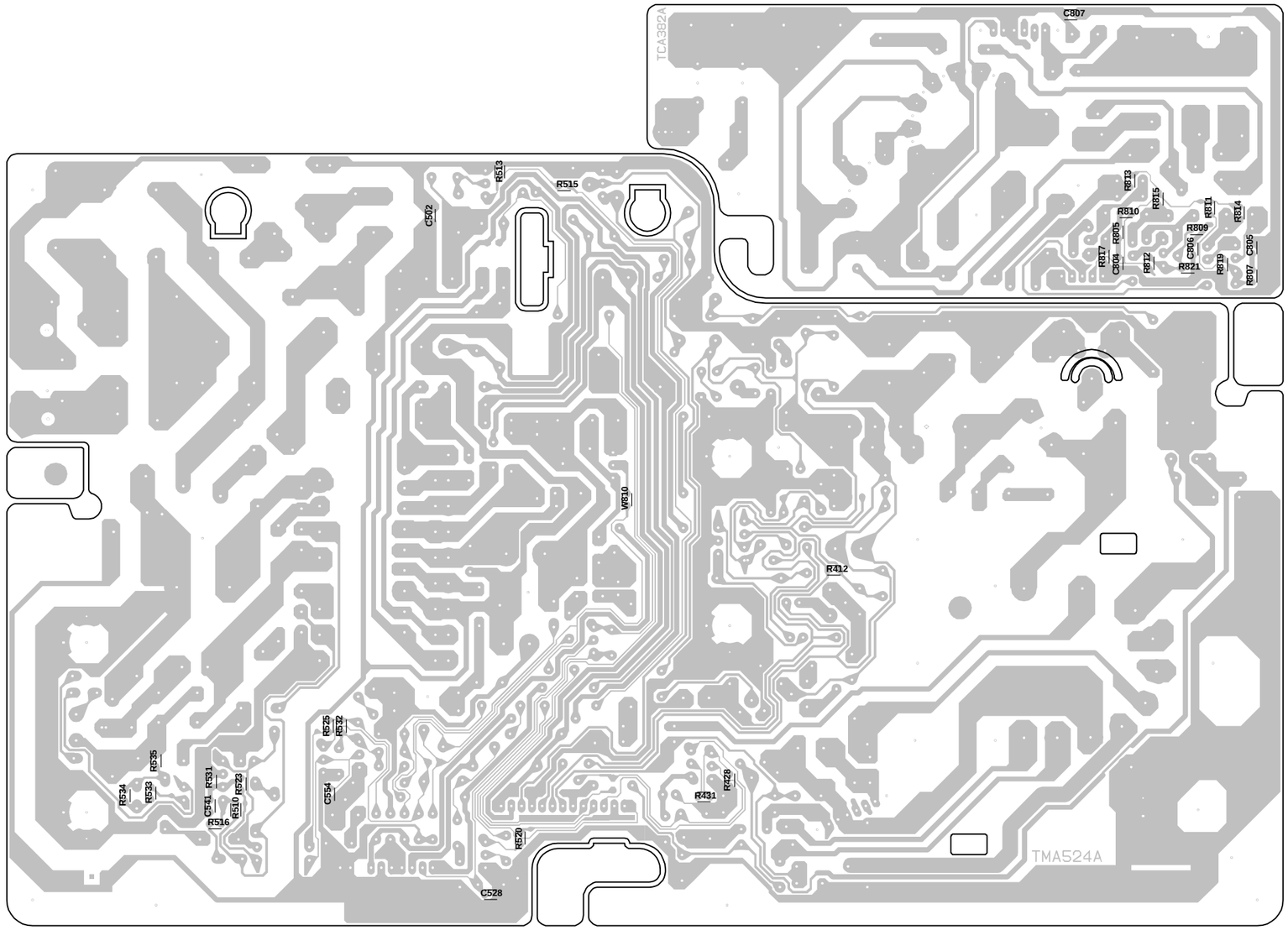
HI-FI BLOCK DIAGRAM



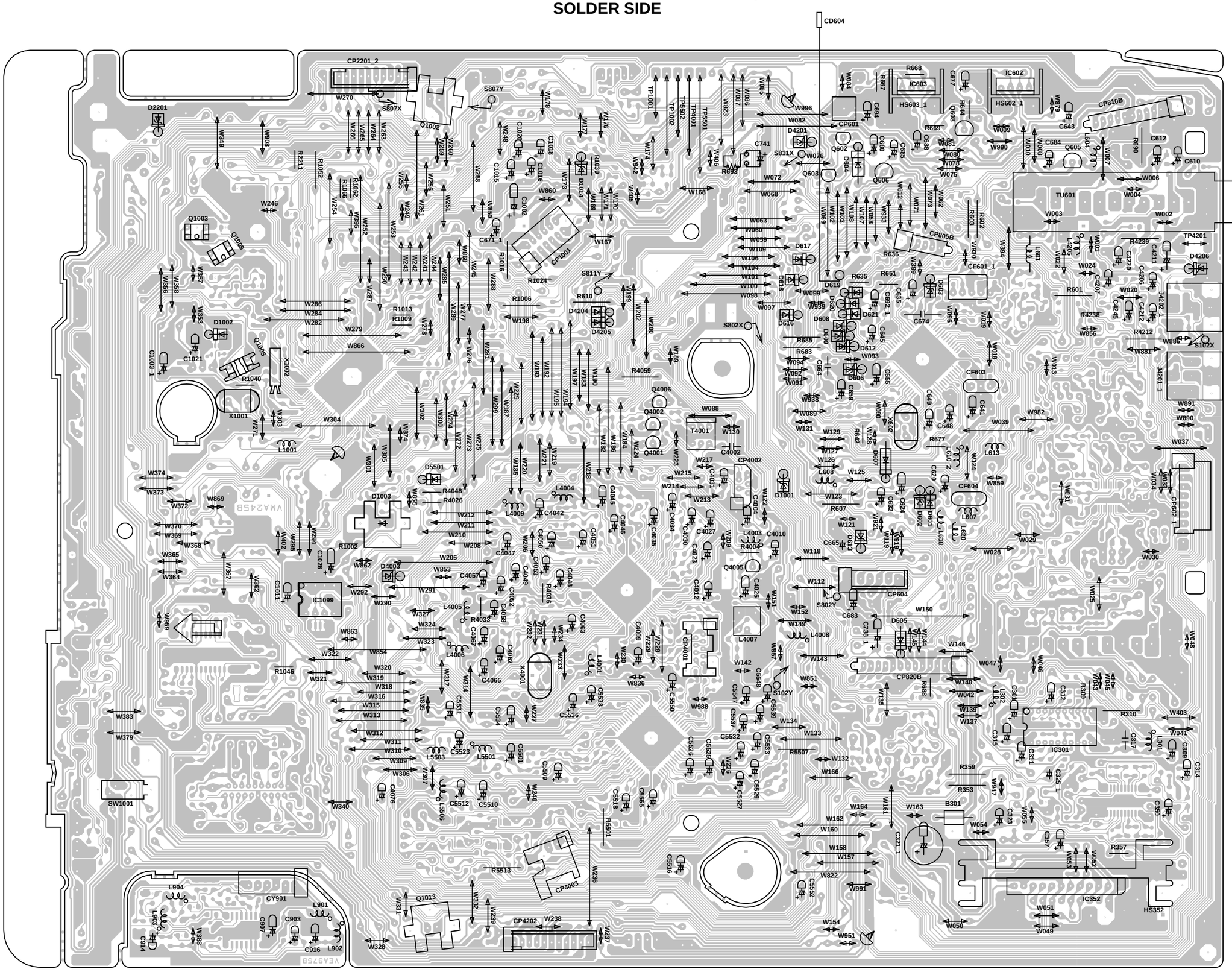
PRINTED CIRCUIT BOARDS
MAIN/CRT (INSERTED PARTS)
SOLDER SIDE



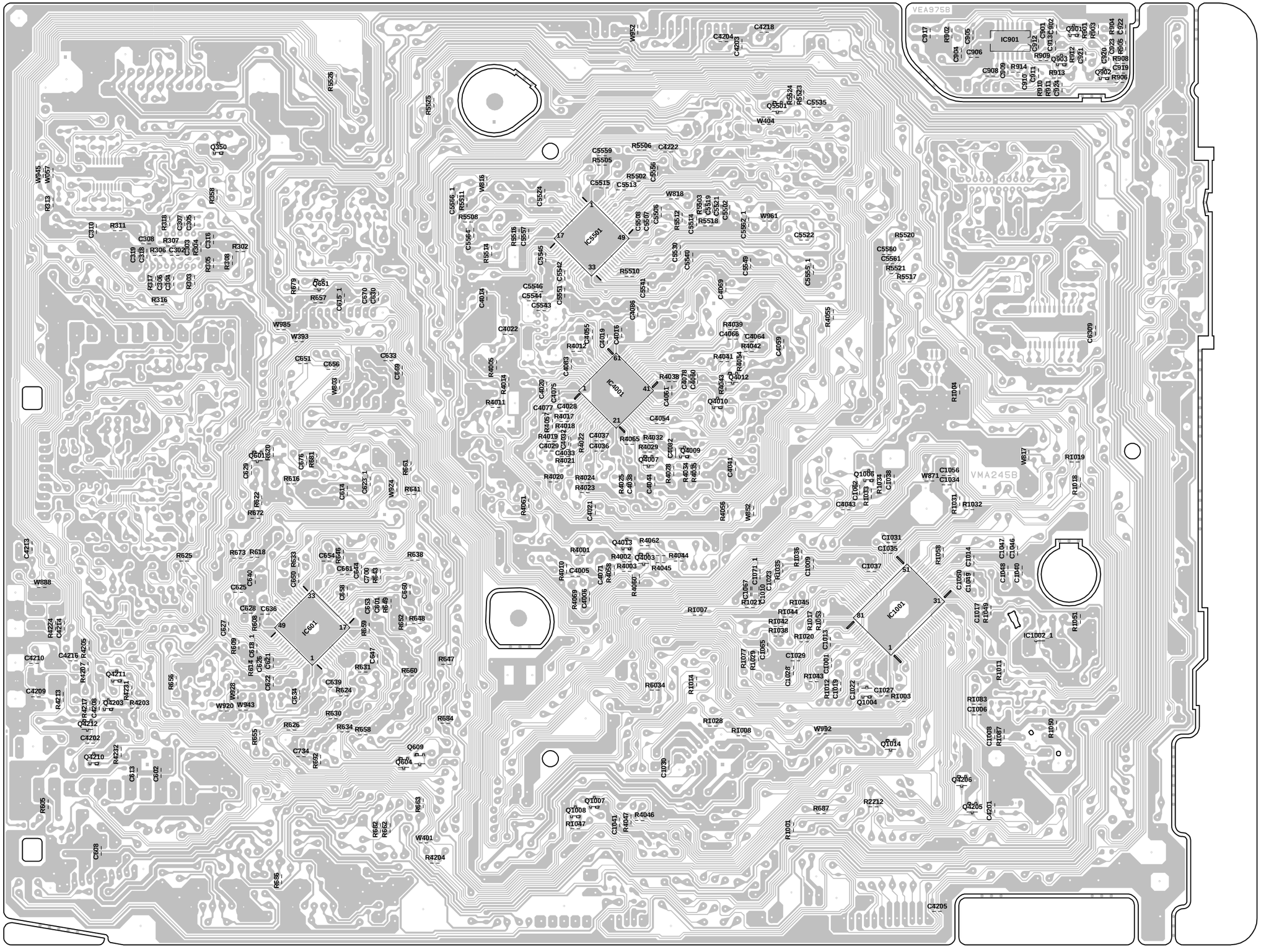
PRINTED CIRCUIT BOARDS
MAIN/CRT (CHIP MOUNTED PARTS)
SOLDER SIDE



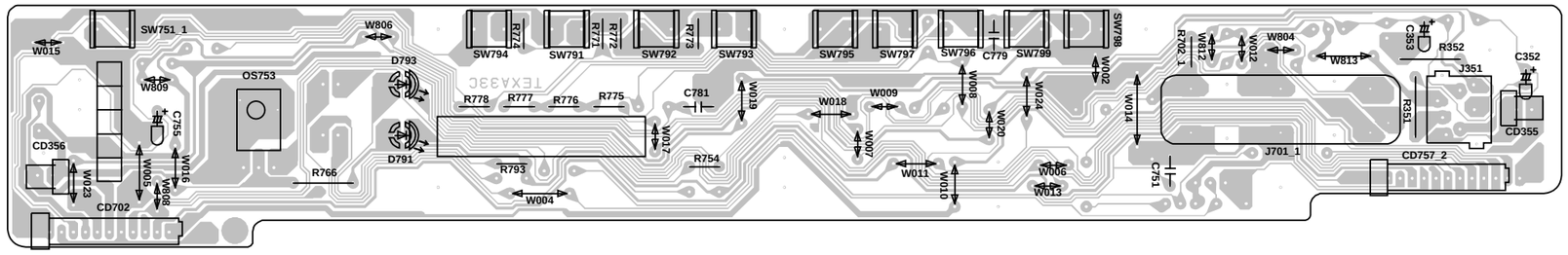
PRINTED CIRCUIT BOARDS
SYSCON/COMB (INSERTED PARTS)
SOLDER SIDE


CD604
CP2201_2
D2201
S807Y
S807X
Q1002
W270
W349
W908
R2211
R1052
R1062
R1066
W246
Q1003
Q1009
W357
W356
W358
W253
D1002
C1021
C1003_1
Q1005
X1002
R1040
X1001
W271
W303
L1001
W304
W374
W373
W372
W869
W370
W369
W368
W365
W364
W367
W362
W359
W383
W379
SW1001
W340
W874
W305
W301
D5501
R4048
R4026
D1003
W855
R1002
W294
W295
W402
C1026
W862
D4003
IC1099
C1011
W292
W290
W291
W205
W853
C4057
W327
L4005
R4033
W324
W323
W322
W854
W321
R1046
W320
W319
W318
W316
W315
W313
W312
W311
W310
W309
W306
W307
L5503
C5523
L5501
C5501
C5509
C5512
C5510
C5506
C4076
W240
W863
W286
W284
W282
W279
W866
R1013
R1009
W278
W277
W288
W276
W281
W245
W868
W238
R1016
R1024
C671_1
W860
W850
C1002
C1015
C1018
C1020
W248
W239
W260
W258
W246
W178
W177
W176
W174
W173
W172
W171
W170
W169
W168
W167
CP1001
D1014
R1039
W942
W405
TP1001
TP1002
TP5502
TP4001
TP5501
W823
W406
W085
W086
W087
W996
W082
D4201
C741
S811X
W076
R693
W072
W068
W063
W060
W059
W109
W106
W104
W101
W100
W098
W097
D617
D618
D619
D620
D621
D616
D608
D609
D612
D606
S802X
R610
D4204
D4205
R1006
W198
W199
W202
W200
W189
R4059
Q4006
Q4002
Q4001
W088
T4001
W130
C4002
CP4002
D1001
W217
W215
W214
W213
C4031
C4034
C4030
C4027
C4023
C4012
C4025
C4024
C4010
R4004
L4003
Q4005
W209
W206
C4047
C4050
C4053
C4049
C4048
C4052
C4059
R4036
C4067
C4063
C4062
C4065
x4001
L4001
L4006
W231
W232
W234
W223
W227
W317
W314
W835
C5553
C5534
C5538
C5536
W836
C4009
W228
W229
W230
CP4001
C5548
C5547
C5550
S102Y
W988
W057
L4007
W142
W143
L4008
W149
W152
W151
W112
S802Y
CP604
C683
C738_1
D605
W150
W146
W140
W042
W139
W137
W134
W133
R5507
W132
W166
W164
W162
W160
W158
W157
W822
W991
W154
W951
W050
W049
W051
IC352
HS352
W053
W052
W055
W054
B301
C321_1
W161
W163
C5516
C5552
C5565
C5518
R5601
W236
CP4003
R5513
W331
Q1013
W332
W239
CP4202
W238
W237
W328
L904
CY901
L901
L903
C903
C907
C914
C916
L902
W388
VEA97S8
VMA24SB
W996
CP601
R668
IC603
HS603_1
C677
IC602
HS602_1
W879
CP810B
C643
R667
C694
Q608
R644
W009
W990
W010
W008
C684
Q605
L604
W007
R690
C612
C610
W081
W080
W078
W075
Q602
Q603
Q606
D604
C688
C685
C680
W812
W071
W073
W062
W069
W102
W103
W107
W108
W058
W033
CP805B
R636
R603
R602
W930
W394
TU601
W006
W004
W003
W002
L601
L605
W022
W001
R4239
C4211
C4220
C4206
C4207
W024
W020
C4245
C4212
J4202_1
R4238
W856
R4212
W881
W886
S102X
D4206
TP4201
J4201_1
W891
W890
W982
W039
W037
W018
W019
W013
CF603
C641
C649
C648
R677
L610_2
L613
W124
CF604
W859
W034
W031
W029
W028
W030
W025
W048
W047
W046
W045
W043
R309
C312
C302
C315
C311
IC301
R310
C317
L301
W041
W403
C309
C314
R359
R353
W947
C325_1
C323
W055
C350
C357
R357
W052
W053
C324
C682
D601
D602
L607
L620
L518
C620
W119
W118
W121
R607
W123
W129
W127
W126
L608
W125
W124
C665
D613
C632
W128
R642
W129
W131
W089
W090
W938
W091
W092
W094
C664
C655
C659
W093
D607
C645
C635
C674
W096
D603
C692_1
W095
W939
D620
D608
D609
R685
R683
R635
R651
W399
W933
W812
W071
W073
W062
W069
W102
W103
W107
W108
W058
W812
W071
W073
W062
W069
W102
W103
W107
W108
W058
W933
W399
R636
CP805B
R603
R602
W930
W394

PRINTED CIRCUIT BOARDS
SYSCON/COMB (CHIP MOUNTED PARTS)
SOLDER SIDE

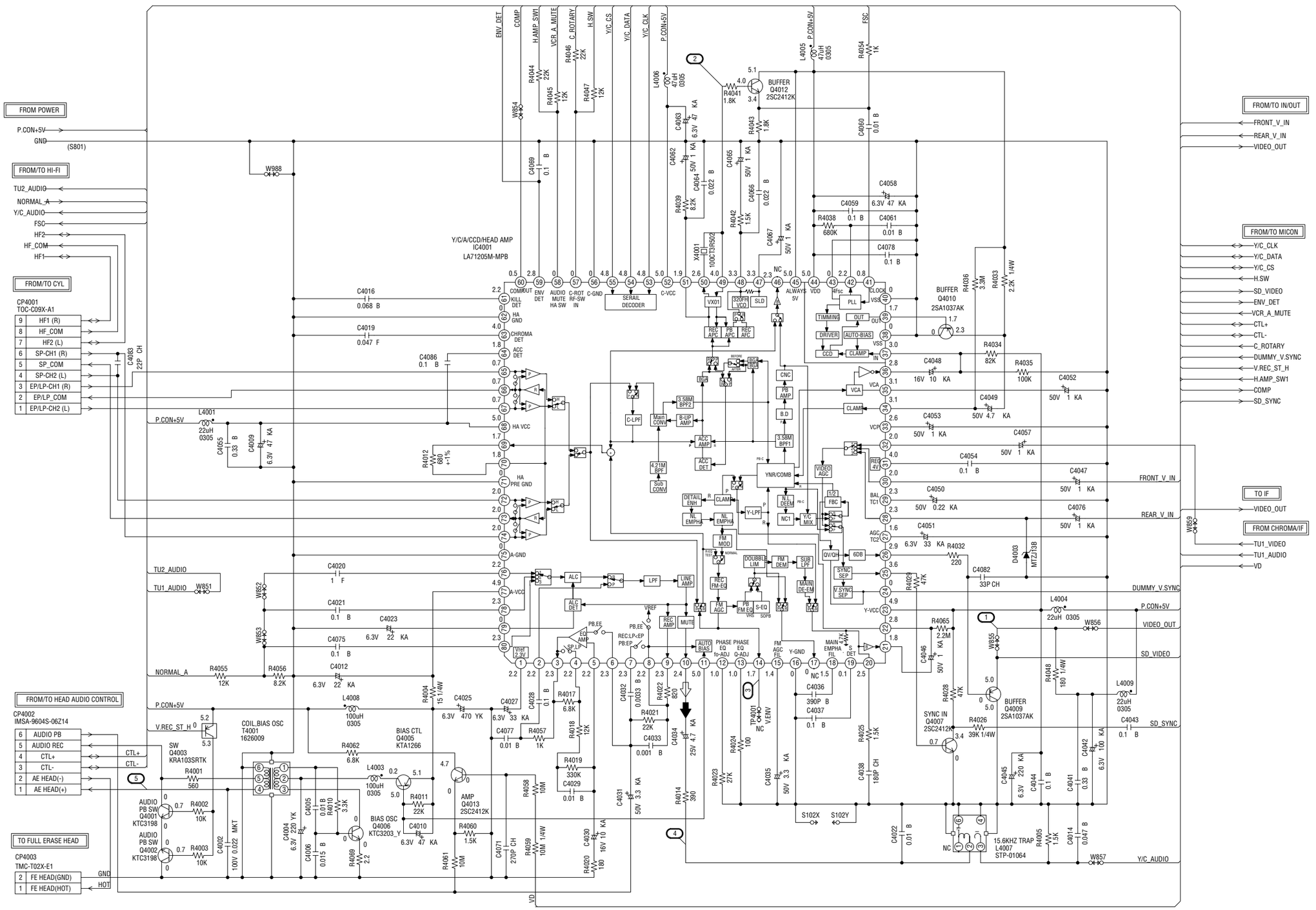


OPERATION
SOLDER SIDE



Y/C/AUDIO/CCD/HEAD AMP SCHEMATIC DIAGRAM

(SYSCON PCB)


FROM POWER
P.CON+5V
GND
(S801)
FROM/TO HI-FI
TU2_AUDIO
NORMAL_A
Y/C_AUDIO
FSC
HF2
HF_COM
HF1
FROM/TO CYL
CP4001
TOC-C09X-A1
9 HF1 (R)
8 HF_COM
7 HF2 (L)
6 SP-CH1 (R)
5 SP_COM
4 SP-CH2 (L)
3 EP/LP-CH1 (R)
2 EP/LP_COM
1 EP/LP-CH2 (L)
C4083 22P CH
L4001 22uH 0305
C4055 0.33 B
C4009 47 KA
W988
W852
W853
W851
TU1_AUDIO
TU2_AUDIO
NORMAL_A
P.CON+5V
FROM/TO HEAD AUDIO CONTROL
CP4002
IMSA-9604S-06Z14
6 AUDIO PB
5 AUDIO REC
4 CTL+
3 CTL-
2 AE HEAD(-)
1 AE HEAD(+)
TO FULL ERASE HEAD
CP4003
TMC-T02X-E1
2 FE HEAD(GND)
1 FE HEAD(HOT)
GND
HOT
Y/C/A/CCD/HEAD AMP
IC4001
LA71205M-MPB
ENV_DET
COMP
H.AMP_SW1
VCR_A_MUTE
C_ROTARY
H.SW
Y/C_CS
Y/C_DATA
Y/C_CLK
P.CON+5V
FSC
W854
R4044 22K
R4045 12K
R4046 22K
R4047 12K
L4006 47uH 0305
L4005 47uH 0305
R4054 1K
BUFFER Q4012 2SC2412K
R4041 1.8K
R4043 1.8K
C4063 6.3V 47 KA
C4062 50V 1 KA
C4064 0.022 B
C4065 50V 1 KA
C4066 0.022 B
C4067 50V 1 KA
C4060 0.01 B
C4089 0.1 B
R4039 8.2K
R4042 1.5K
X4001 100CT3R502
C4058
C4059 6.3V 47 KA
R4038 680K
C4061 0.01 B
C4078 0.1 B
C4016 0.068 B
C4019 0.047 F
C4086 0.1 B
C4020 1 F
C4021 0.1 B
C4023 6.3V 22 KA
C4075 0.1 B
C4012 6.3V 22 KA
R4055 12K
R4056 8.2K
L4008 100uH 0305
R4004 15 1/4W
C4025 6.3V 470 YK
C4027 6.3V 33 KA
C4028 0.1 B
R4017 6.8K
R4062 6.8K
C4077 0.01 B
R4057 1K
R4018 12K
R4019 330K
C4029 0.01 B
L4003 100uH 0305
R4011 22K
C4010 6.3V 47 KA
R4060 1.5K
R4061 10M
C4071 270P CH
R4059 10M 1/4W
C4030 16V 10 KA
R4020 180
R4069 2.2
C4004 6.3V 220 YK
C4005 0.01 B
R4010 3.3K
C4006 0.015 B
C4002 100V 0.022 MKT
R4001 560
R4002 10K
R4003 10K
AUDIO PB SW Q4001 KTC3198
AUDIO PB SW Q4002 KTC3198
SW Q4003 KRA103SRTK
V.REC_ST_H
CTL+
CTL-
COIL,BIAS OSC T4001 1626009
BIAS CTL Q4005 KTA1266
BIAS OSC Q4006 KTC3203_Y
AMP Q4013 2SC2412K
R4012 680 +-1%
C4032 0.0033 B
R4022 820
R4021 22K
C4033 0.001 B
C4034 25V 4.7 KA
R4014 390
C4031 50V 3.3 KA
R4023 27K
C4035 50V 3.3 KA
R4024 100
R4025 1.5K
C4038 180P CH
TP4001 C4001 V.ENV NC
C4036 390P B
C4037 0.1 B
R4026 39K 1/4W
SYNC IN Q4007 2SC2412K
R4028 47K
C4046 50V 1 KA
R4065 2.2M
W855
BUFFER Q4009 2SA1037AK
R4048 180 1/4W
L4009 22uH 0305
C4043 0.1 B
SD_SYNC
R4036 3.3M
R4033 2.2K 1/4W
BUFFER Q4010 2SA1037AK
R4034 82K
R4035 100K
C4048 16V 10 KA
C4052 50V 1 KA
C4049 50V 4.7 KA
C4053 50V 1 KA
C4057 50V 1 KA
C4054 0.1 B
C4047 50V 1 KA
C4050 50V 0.22 KA
C4076 50V 1 KA
C4051 6.3V 33 KA
R4032 220
D4003 MTZJ13B
C4082 33P CH
R4029 47K
L4004 22uH 0305
W856
W857
S102X
S102Y
C4022 0.01 B
15.6KHZ TRAP L4007 STP-01064
R4005 1.5K
C4014 0.047 B
C4041 0.33 B
C4042 6.3V 100 KA
C4044 0.1 B
C4045 6.3V 220 KA
FROM/TO IN/OUT
FRONT_V_IN
REAR_V_IN
VIDEO_OUT
FROM/TO MICON
Y/C_CLK
Y/C_DATA
Y/C_CS
H.SW
SD_VIDEO
ENV_DET
VCR_A_MUTE
CTL+
CTL-
C_ROTARY
DUMMY_V.SYNC
V.REC_ST_H
H.AMP_SW1
COMP
SD_SYNC
TO IF
VIDEO_OUT
FROM CHROMA/IF
TU1_VIDEO
TU1_AUDIO
VD
W659
DUMMY_V.SYNC
P.CON+5V
VIDEO_OUT
SD_VIDEO
SD_SYNC
FRONT_V_IN
REAR_V_IN
Y/C_AUDIO
PCB010
VMA245
SERAIL DECODER
REC APC
PB APC
REC APC
320FR VCO
SLD
VXO1
PLL
TIMMING
OUT
DRIVER
AUTO-BIAS
CCD
CLAMP
VCA
CLAMP
VCP
REG 4V
BAL TC1
AGC TC2
6DB
SYNC SEP
V.SYNC SEP
QV/OH
FBC
VIDEO AGC
YNR/COMB
Y/C MIX
NL DEEM
DETAIL ENH
NL EMPHA
FM MOD
DOUBBL LIM
FM DEM
SUB LPF
MAIN DE-EM
FM AGC
PB FM EQ
S-EQ
REC FM-EQ
ALC
ALC DET
LPF
LINE AMP
REC AMP
MUTE
AUTO BIAS
PHASE EQ fo-ADJ
PHASE EQ Q-ADJ
FM AGC FIL
MAIN EMPHA FIL
S DET
Y-GND
VREF
PB.EE
REC.LP<EP
PB<EP
EQ AMP
SP.LP
Vref 2.3V
C-LPF
Main CONV
B-UP AMP
Sub CONV
4.21M BPF
ACC AMP
ACC DET
3.58M BPF2
3.58M BPF1
B.D
PB AMP
CNC
Y-LPF
A-GND
A-VCC
Y-VCC
HA VCC
HA PRE GND
VD
NC
ALWAYS 5V
VDD
CLOCK
VSS
IN
OUT
Hfsc
VCA
VCP
REG 4V
BAL TC1
AGC TC2
6DB
QV/OH
FBC
SYNC SEP
V.SYNC SEP

MICON SCHEMATIC DIAGRAM (SYSCON PCB)

FROM/TO POWER
AT+5V[BACKUP]
AT+5V[UCON]
GND
P.CON+5V
AT+12V
MOTOR_GND
STANDBY-H

FROM/TO DECK
CP1001
TMC-J12P-B2

1	CAP_FG
2	CAP_VCO
3	VCC
4	CAP/M/F/R
5	I_LIMIT
6	GND[M]
7	GND
8	LD/CY_VCO
9	CAP_CTL
10	LDM_CTL
11	CYL_FG/PG
12	CYL_CTL

POWER_FAIL
BUFFER Q1008 2SA1037AK
D1001 MTZJ11B
VCR_A_MUTE
TV_A_MUTE
EXT_A_MUTE
IIC_OFF
CAP_FG
CYL_FG/PG
BOT
EOT
TAB_SW
CENTER_LED
CTL-
CTL+
AMP C
CTL AMP-OUT
ST_SELECT
S807Y
S802X
W869
W868
W866
W862
W863
W823
W860
W874
W871
W992

REEL-T
REEL-S
CAP FULL
DRUM-PWM
CAP-PWM
VOLUME/REC_AGC
JUST CLOCK
FF/REW-L
IIC-DATA1
IIC-CLK1
SCLK
CS
SDATA
BBE_H
V_REC_START_H
NC(AV3)
R
G
B
CENTER LED
OSD OUT1
V-SYNC
H-SYNC
NUA
CVIN
VHOLD
HLF
OSD-VCC
SD-IN
SERVICE

81 VCR_A_MUTE
82 TV_A_MUTE
83 EXT_A_MUTE
84 NC(TUNER_CTL)
98 AMP-VCC
99 ANALOG VCC
100 DEW/ST_SELECT
50 TAB SW
49 OSD-VSS
48 AV2
33 PLAY LED
32 RENT_H / OTPB_LED
31 ON-TIMER LED

TIMER SYSCON MICON IC
IC1001
OEC7071A

AV1
NUB
OSC-OUT2
OSC-IN2
CLKSEL
NC(CS_REC_LED)
X-RAY-TEST
VSS
X-OUT(12MHz)
X-IN(12MHz)
VCC
XC_OUT(32KHz)
XC_IN(32KHz)
RESET-L

SERVICE TP1001 NC
TAB_SW
HD
VD

FROM/TO HI-FI
V.REC_ST_H
HIFI_ENV
HIFI_H.SW
SCL
SDA
ST_SELECT
VCR_A_MUTE

FROM/TO Y/C/AUDIO/HEAD AMP
Y/C_CLK
Y/C_DATA
Y/C_CS
H.SW
SD_VIDEO
ENV_DET
VCR_A_MUTE
CTL+
CTL-
C_ROTARY
DUMMY_V.SYNC
V.REC_ST_H
H.AMP_SW1
COMP
SD_SYNC

FROM/TO CHROMA/IF
HD
VD
DEGAUSS_H
POWER_FAIL
OSD_R
OSD_G
OSD_B
OSD_BLK
SDA
SCL
AFT_M
VCR_POWER_H
X_RAY_TEST
PROTECT
IIC_OFF
PROTECT_A
H_CONTROL

FROM/TO IN/OUT
VCR_A_MUTE
REC_LED
T-REC_LED
KEY_A
KEY_B
REMOCON_IN
EXT_MUTE
EXT_A_MUTE

FROM/TO SOUND AMP
TV_POWER_H
TV_A_MUTE
SCL
SDA

MS_SEN-A
MS_SEN-B
EOT
BOT
HI-FI-ENV
VIDEO-ENV
AFT(MONI)
AFT(REC)
KEY 1
KEY 2
CAP-FWD
CAP-LIMIT
DUMMY-V.SYNC
REMOCON-IN
COLOR ROTARY
HEAD AMP SW
ENV-CMP-IN
VIDEO-H.SW
HI-FI-H.SW
LDM CTL
X-RAY IN
DEGAUSS_H
STANDBY-H
H CONTROL
PROTECT
VIDEO-MUTE
VCR-POWER
TV-POWER
T-REC LED
REC LED

TV_POWER_H
VCR_POWER_H
H.SW
COMP
STANDBY-H
PROTECT_A

PROTECT SW Q1014 KRC103SRTK
PROTECT SW Q1007 KRC103SRTK
TP1002 NC H.SW
HIFI_H.SW TP5502 NC
W817

EOT SENSOR Q1013 ST-304L
BOT SENSOR Q1002 ST-304L
CENT SW Q1006 KRC103SRTK
D1003 LNA2702L010R
SW1001 MXS0138MPP0
FF/REW_SW Q1004 KRC103SRTK
REEL SENS Q1005 RPI-303
MS_SEN B Q1003 RPI-352C40N
MS_SEN A Q1009 RPI-352C40N
EEP ROM IC IC1099 S-24C04BDP-LA
SYSTEM RESET IC IC1002_1 R3111N311A/C
D1002 1SS133
X1001 100CT01207
X1002 100DA32R01

AUDIO SIGNAL(REC)
CAPSTAN AFC SIGNAL
TUNER VIDEO SIGNAL
DEFLECTION SIGNAL
CYLINDER APC SIGNAL
B.SIGNAL
G.SIGNAL
R.SIGNAL

PCB010
VMA245

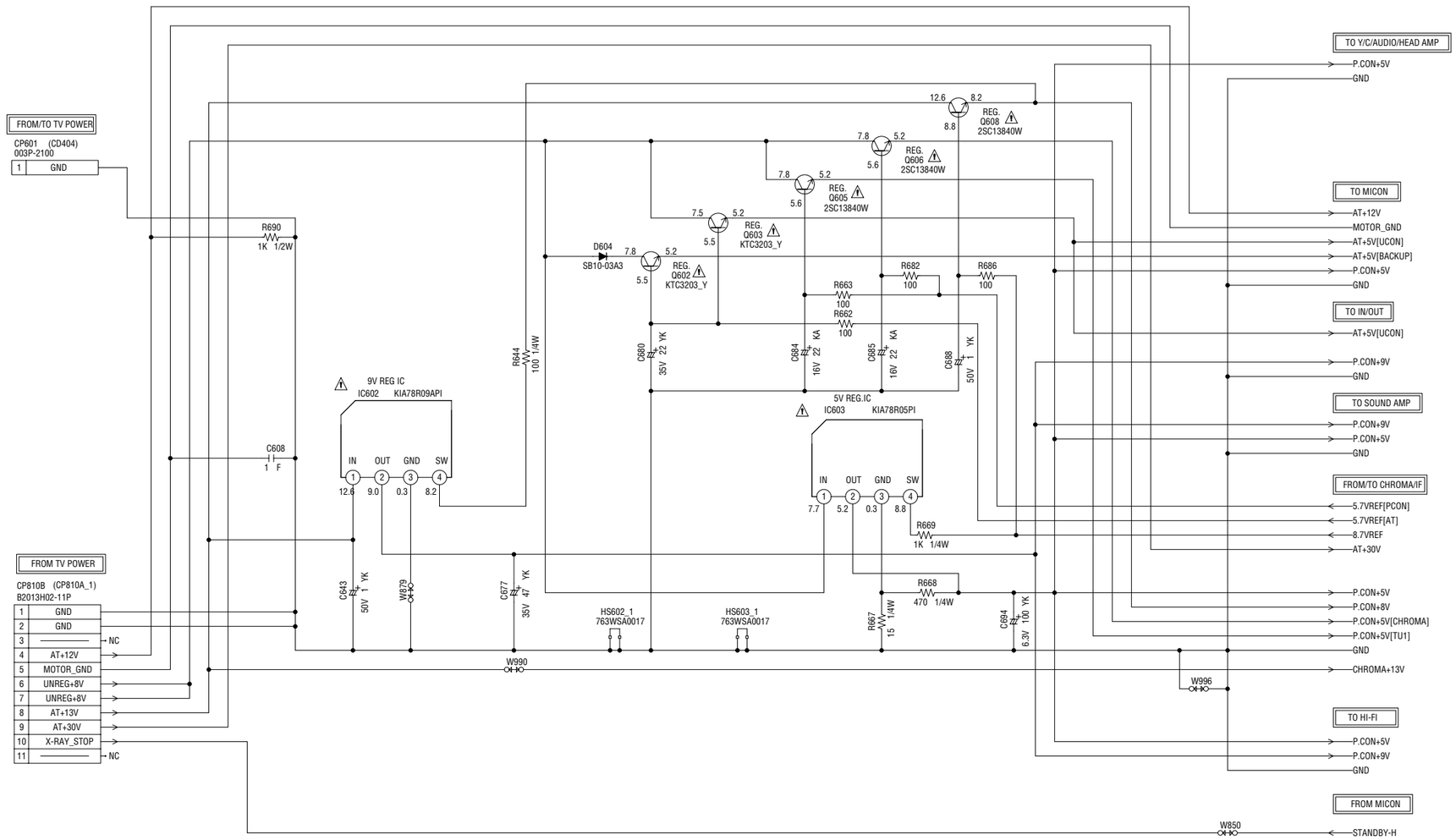
CAUTION: DIGITAL TRANSISTOR

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK。

POWER SCHEMATIC DIAGRAM

(SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING RECORDING (SP MODE)

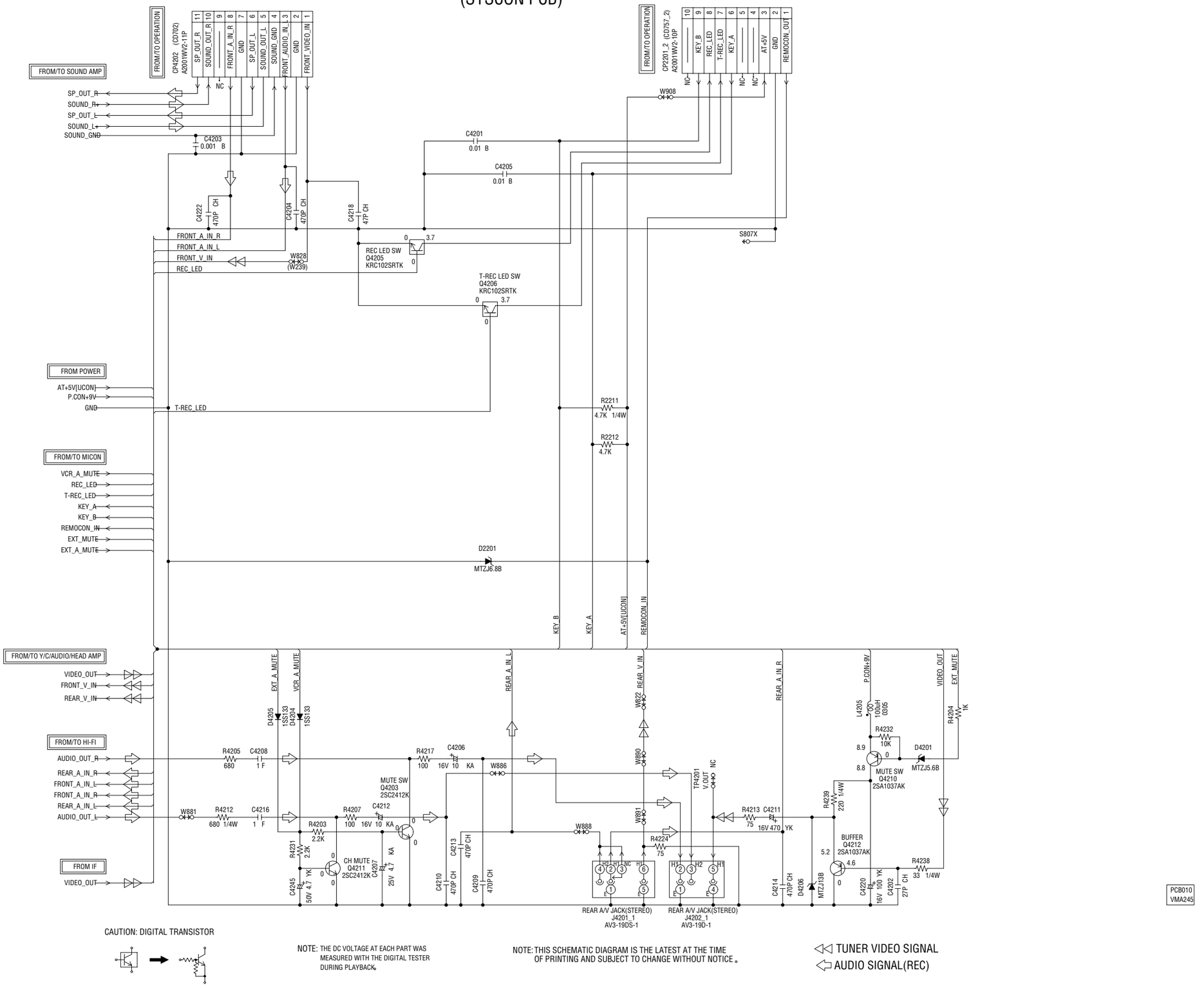
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

PCB010
VMA245

IN/OUT SCHEMATIC DIAGRAM
(SYSCON PCB)



CAUTION: DIGITAL TRANSISTOR

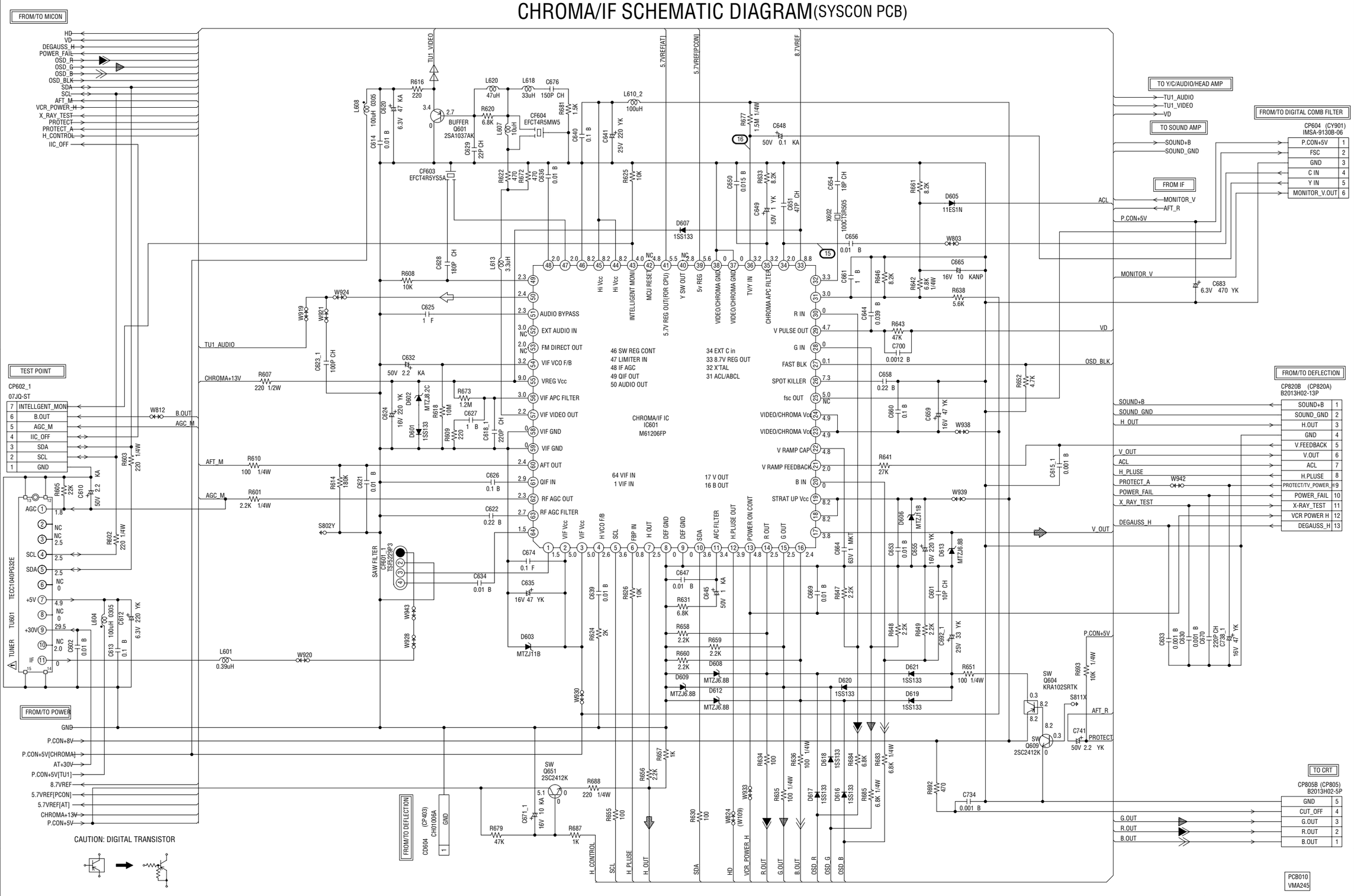
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

◁◁ TUNER VIDEO SIGNAL

◁ AUDIO SIGNAL(REC)

CHROMA/IF SCHEMATIC DIAGRAM(SYSCON PCB)


FROM/TO MICON
HD
VD
DEGAUSS_H
POWER_FAIL
OSD_R
OSD_G
OSD_B
OSD_BLK
SDA
SCL
AFT_M
VCR_POWER_H
X_RAY_TEST
PROTECT
PROTECT_A
H_CONTROL
IIC_OFF
TU1_VIDEO
5.7VREF(AT)
5.7VREF(PCON)
8.7VREF
TO Y/C/AUDIO/HEAD AMP
TU1_AUDIO
TU1_VIDEO
VD
TO SOUND AMP
SOUND+B
SOUND_GND
FROM IF
MONITOR_V
AFT_R
FROM/TO DIGITAL COMB FILTER
CP604 (CY901)
IMSA-9130B-06
P.CON+5V
FSC
GND
C IN
Y IN
MONITOR_V.OUT
ACL
W803
MONITOR_V
TU1_AUDIO
CHROMA+13V
AUDIO BYPASS
EXT AUDIO IN
FM DIRECT OUT
VIF VCO F/B
VREG Vcc
VIF APC FILTER
VIF VIDEO OUT
VIF GND
VIF GND
AFT OUT
QIF IN
RF AGC OUT
RF AGC FILTER
SAW FILTER
CF601_1
TSF229P3
CF603
EFCT4R5Y5SA
CF604
EFCT4R5MW5
BUFFER
Q601
2SA1037AK
D607
1SS133
D605
11ES1N
X602
100C73H505
D603
MTZJ11B
D608
D609
D612
D620
1SS133
D621
1SS133
D619
1SS133
L601
0.39uH
W920
W924
W919
W921
W812
B.OUT
AGC_M
IIC_OFF
SDA
SCL
GND
TEST POINT
CP602_1
07JQ-ST
TU601
TECC1040P532E
TUNER
IF
+5V
+30V
NC
SCL
SDA
AGC
S802Y
W943
W928
W930
W920
W938
W939
W942
W933
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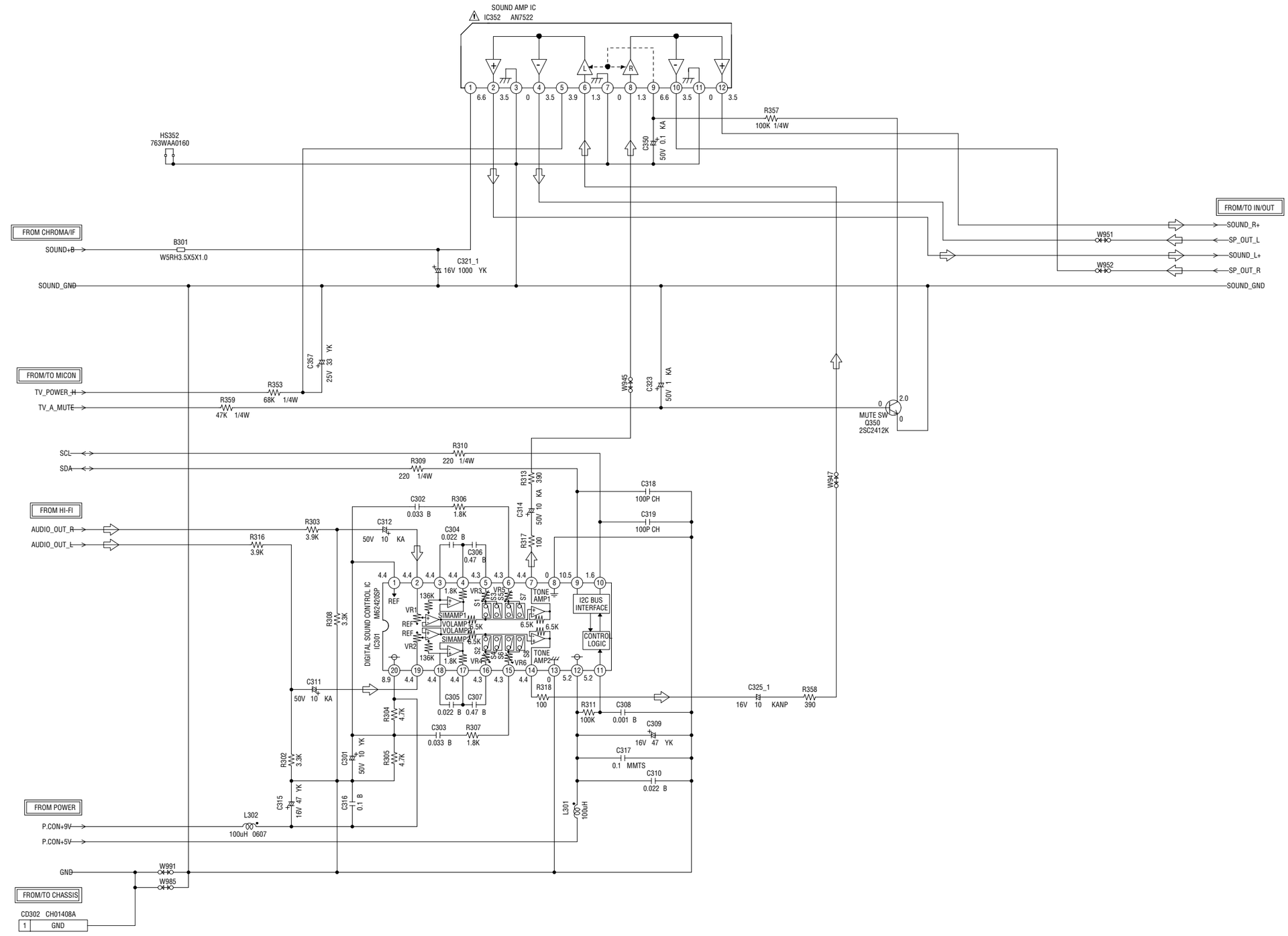
W983

SOUND AMP SCHEMATIC DIAGRAM
(SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING RECORDING (SP MODE)

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

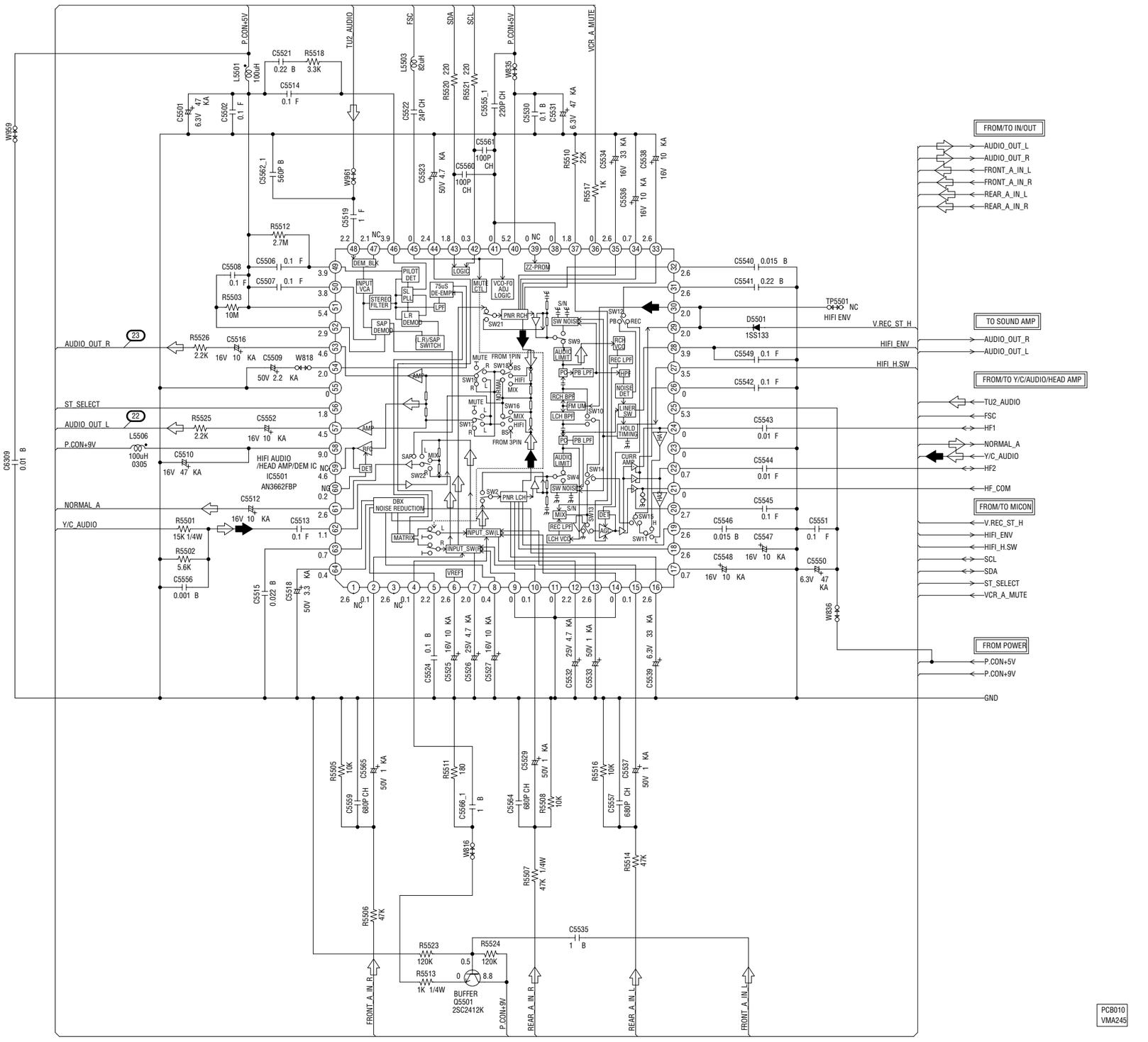
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

⇦ AUDIO SIGNAL(REC)

HI-FI SCHEMATIC DIAGRAM

(SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

AUDIO SIGNAL(REC)

AUDIO SIGNAL(PB)

IF SCHEMATIC DIAGRAM

(SYSCON PCB)

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

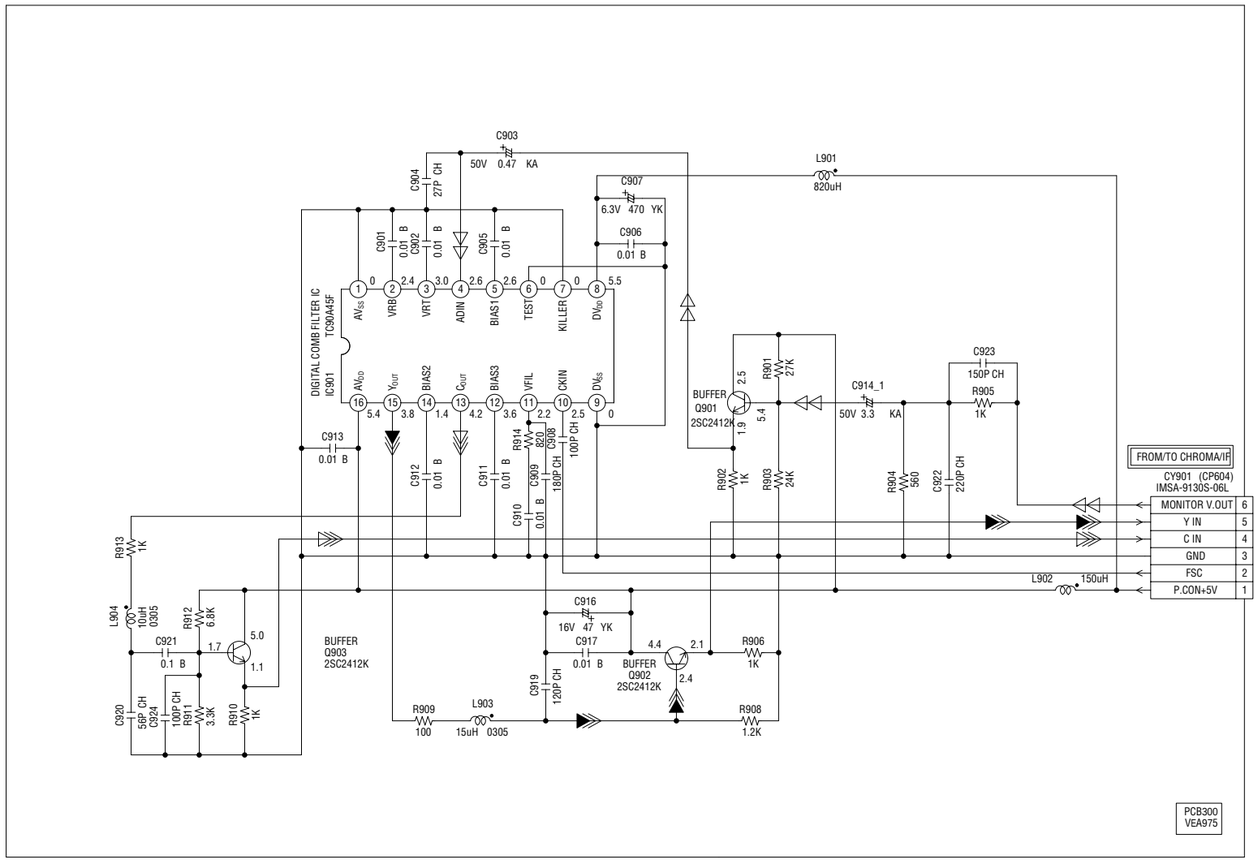
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

◁◁ TUNER VIDEO SIGNAL

PCB010
VMA245

DIGITAL COMB FILTER SCHEMATIC DIAGRAM

(COMB PCB)



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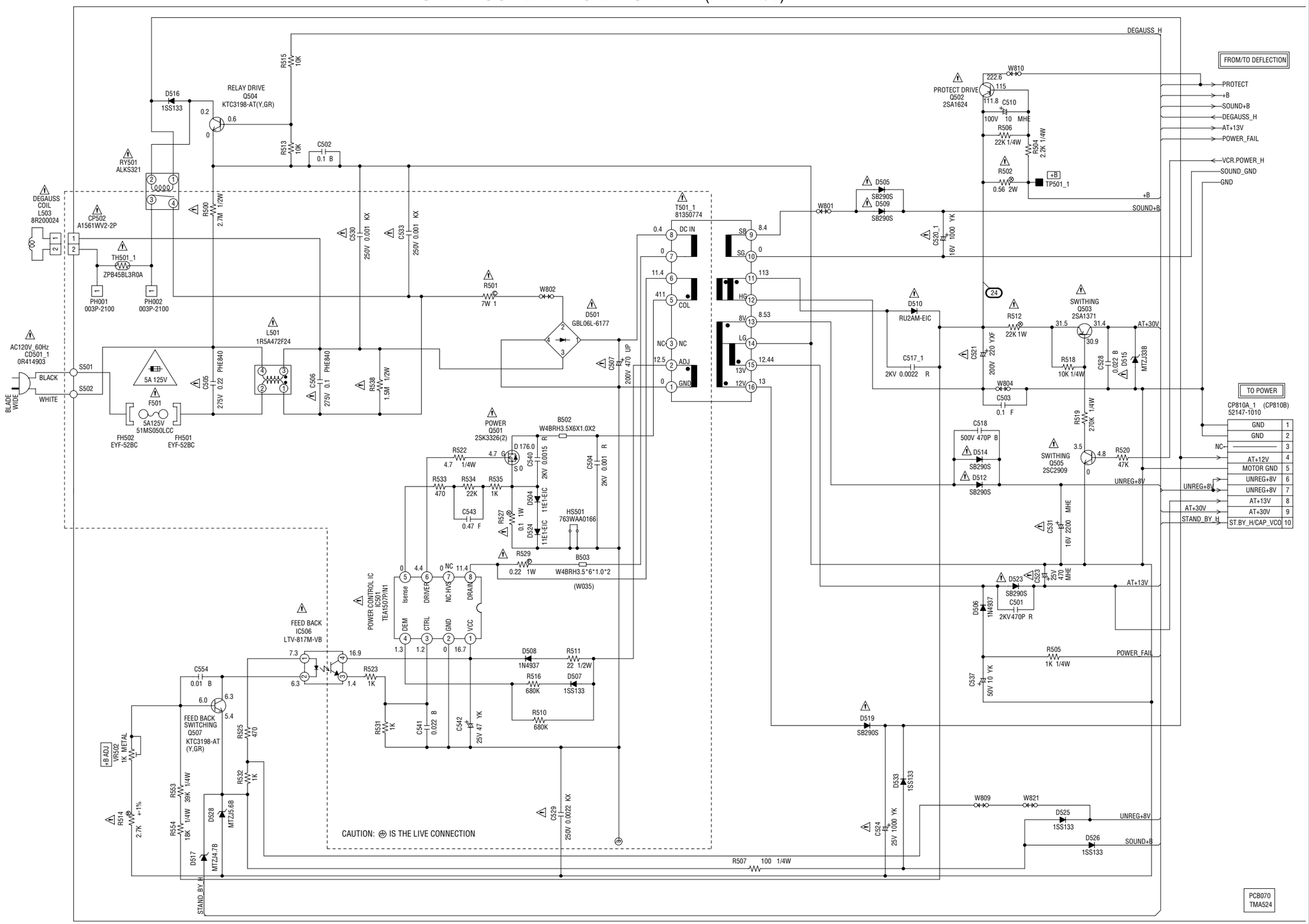
◁◁ TUNER VIDEO SIGNAL
◀◀ LUMINANCE SIGNAL
◁◁ COLOR SIGNAL

TV POWER SCHEMATIC DIAGRAM (MAIN PCB)



5A 125V

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE
5A 125V(F501)

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE
5A 125V(F501)

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

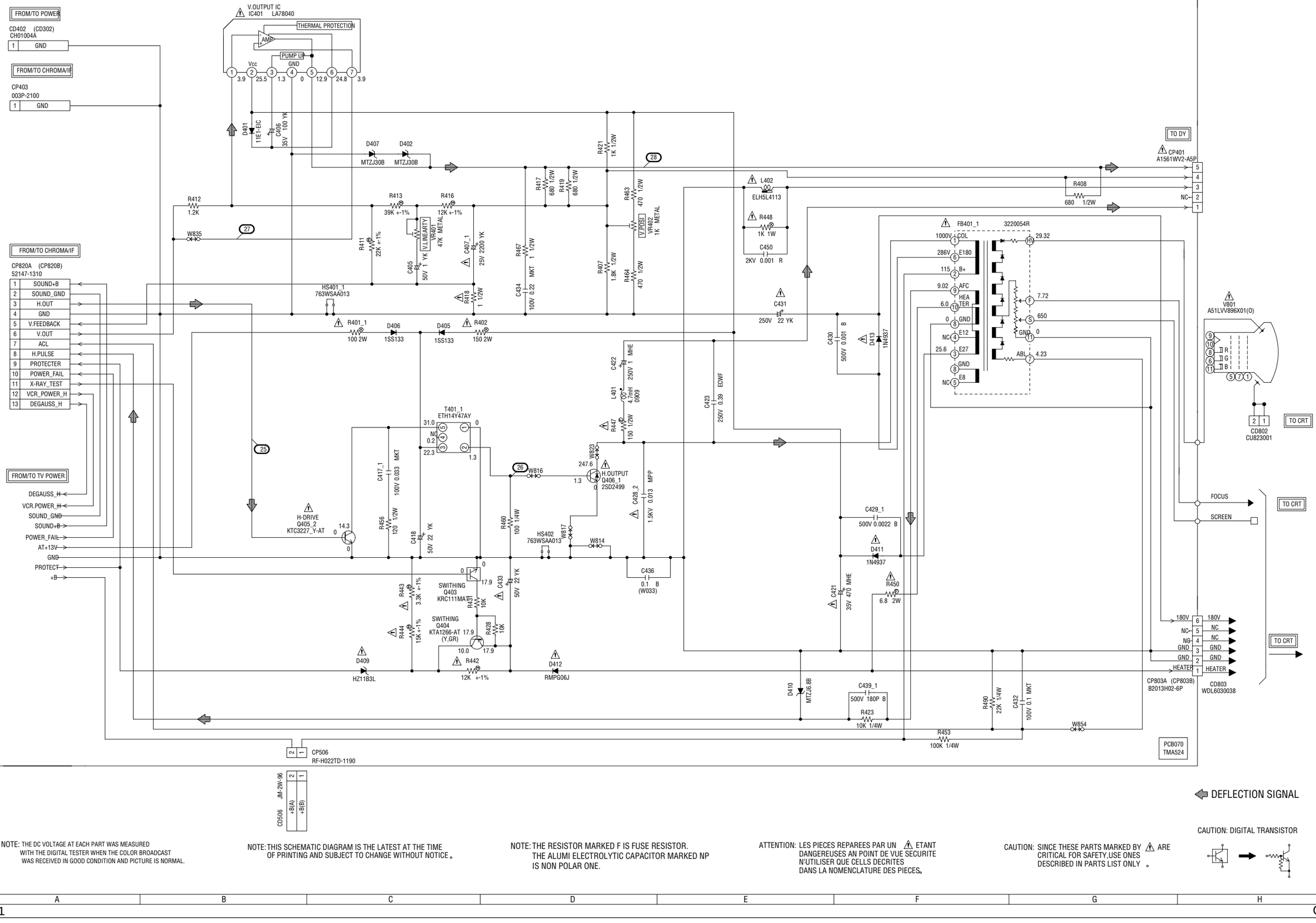
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

DEFLECTION SCHEMATIC DIAGRAM(MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

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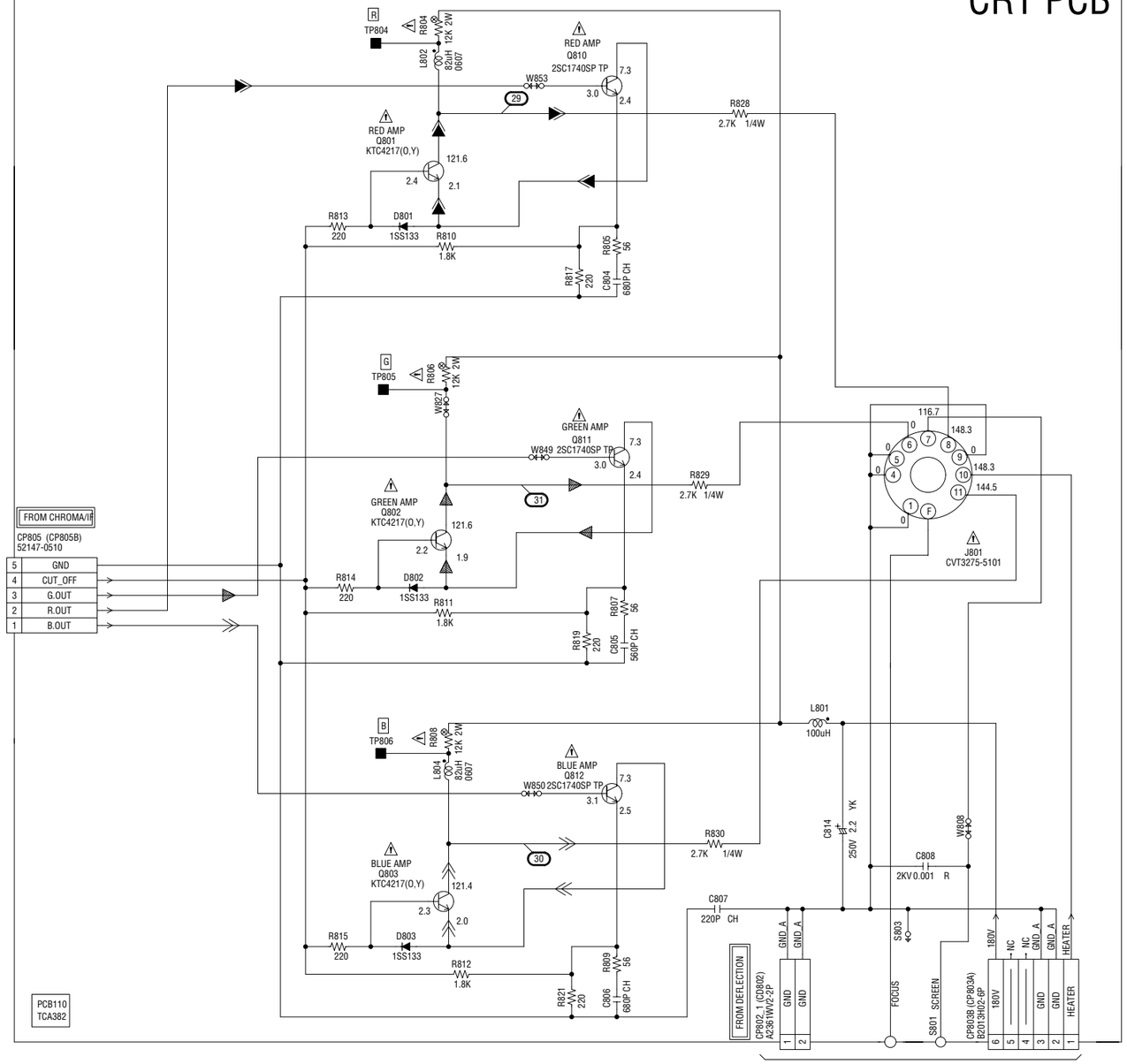
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

CRT SCHEMATIC DIAGRAM

(CRT PCB)

CRT PCB



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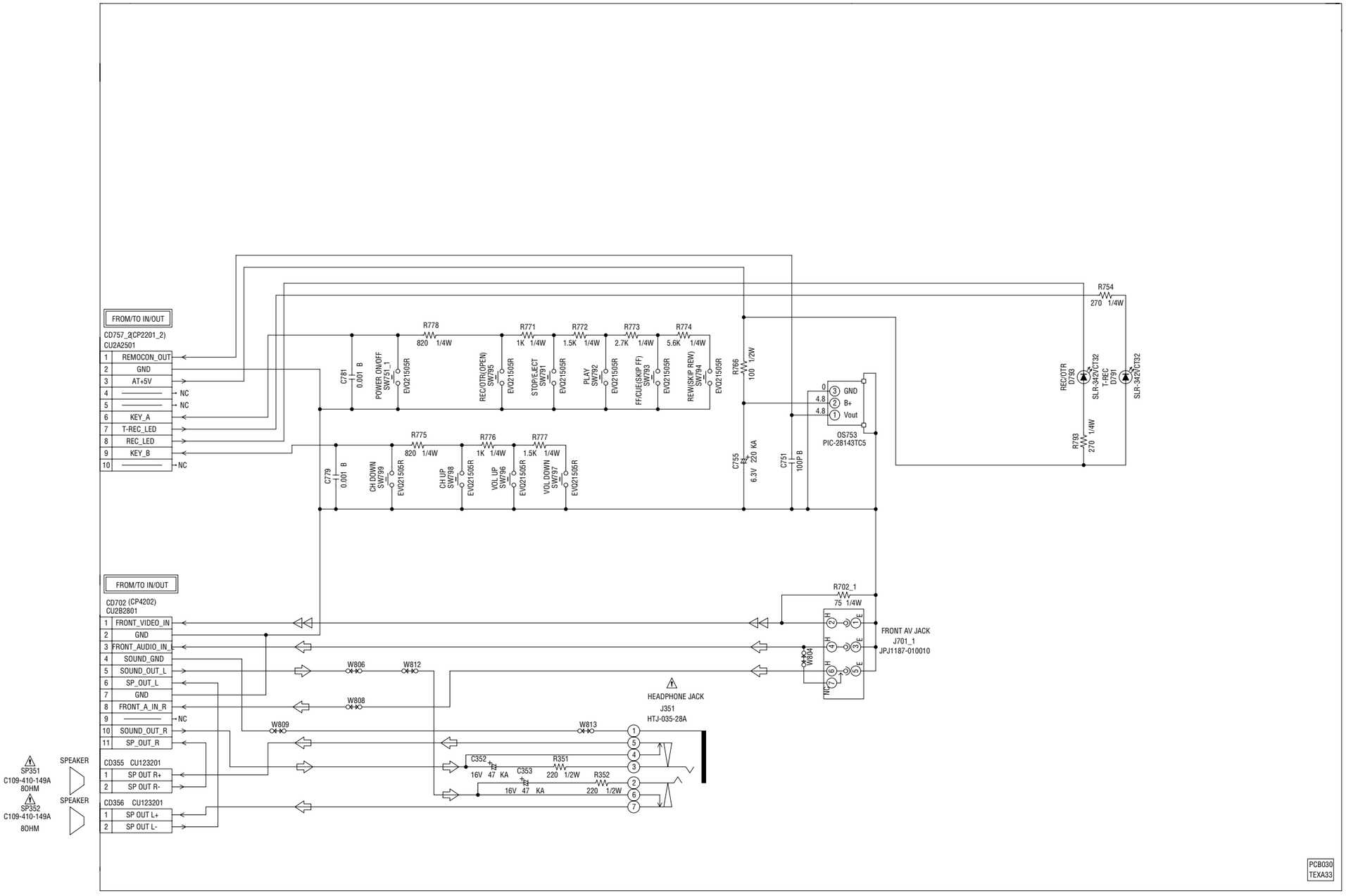
◀ R.SIGNAL
◀ G.SIGNAL
≪ B.SIGNAL

OPERATION SCHEMATIC DIAGRAM

(OPERATION PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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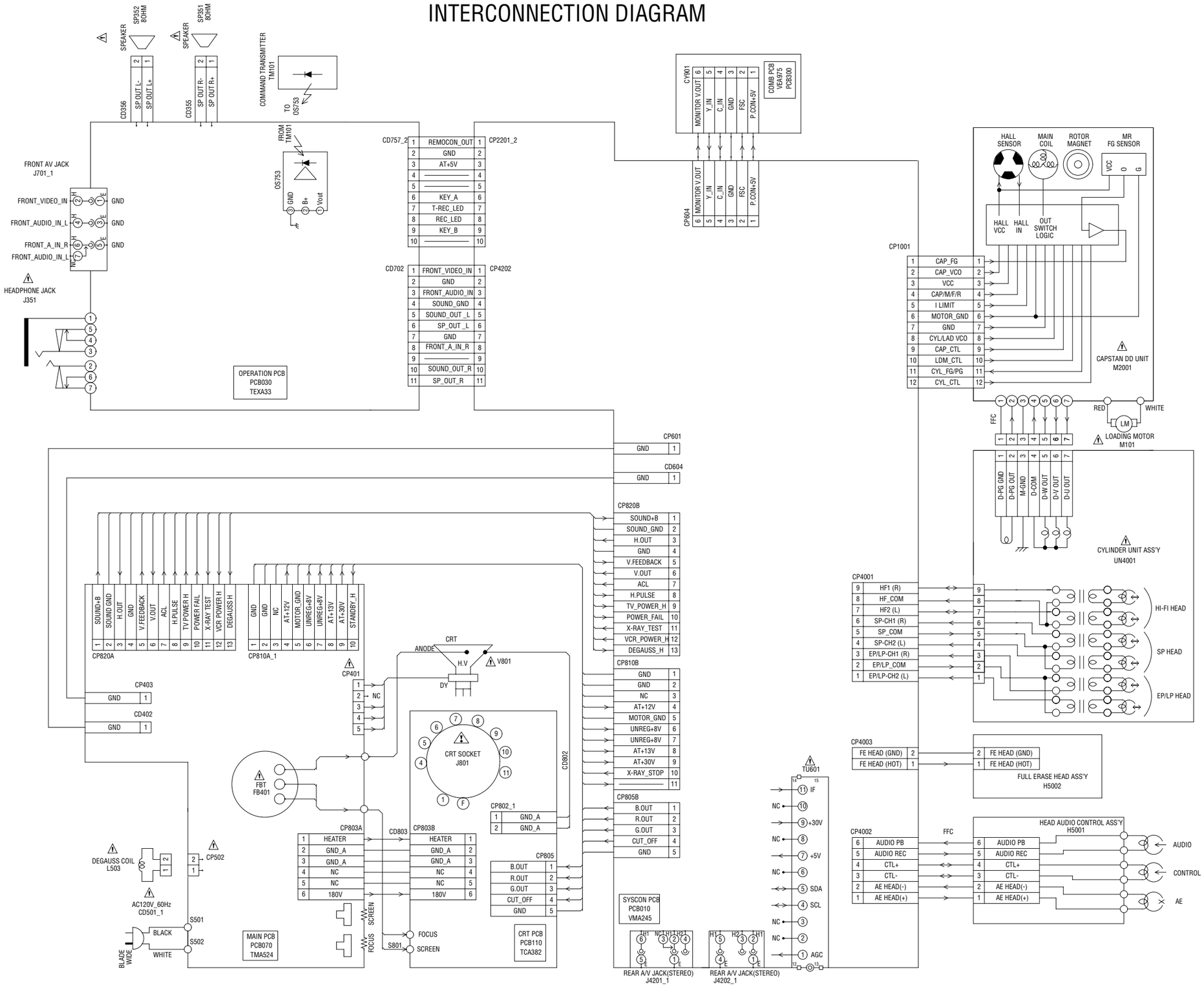
◁◁ TUNER VIDEO SIGNAL
◁ AUDIO SIGNAL

INTERCONNECTION DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

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NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

TOSHIBA VIDEO PRODUCTS PTE. LTD.

438B ALEXANDRA ROAD, BLOCK B #06-01 ALEXANDRA TECHNOPARK SINGAPORE 119968

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